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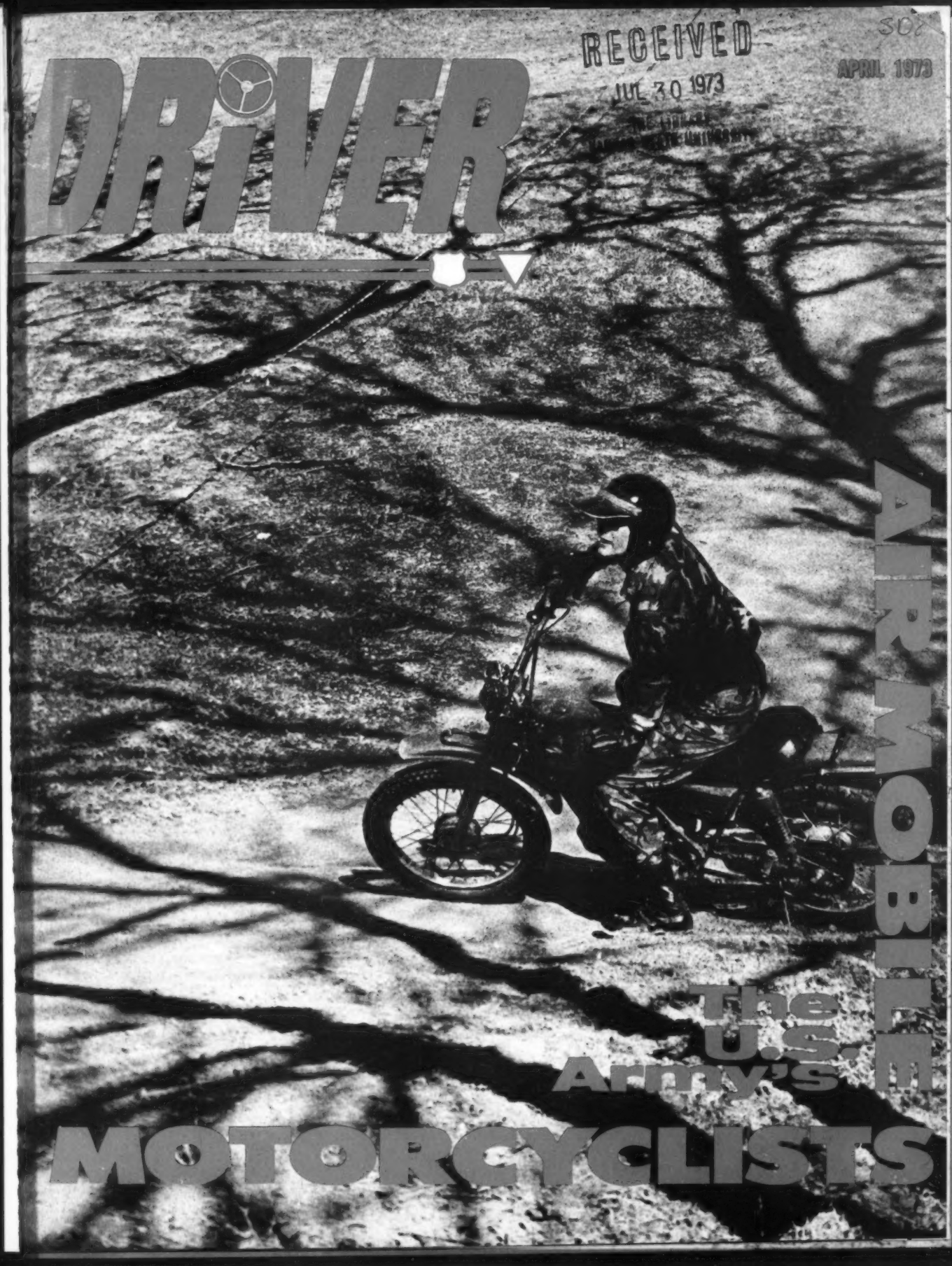
DRIVER



AIRMOBILE

The U.S. Army's MOTORCYCLISTS

DRIVER

The U.S. Army's AIR MOBILE MOTORCYCLISTS

"...and the cycles go rolling along...."

The two youthful helmeted and visored Cavalry scouts hid their 185cc motorcycles in a clump of mesquite and moved quietly on foot toward their objective. It was nighttime, and a half moon gave a little light as they ducked through some trees and came to the dry river bed. Below them was the Aggressor camp, tents outlined in the moonlight, and a few sentries pacing their posts. The scouts used a backpack radio to report the camp's site, then pulled back to their bikes to begin the long cross-country night ride to friendly territory.

A short time later a Huey chopper whop-whopped overhead, found the camp, and dropped a flare. The Aggressor unit was "out" of the battalion exercise. The young troopers were glad they knew how to handle cycles, because the cross-country riding was rough and they expected strong Aggressor reaction. They negotiated a couple of dry washes, skirted cacti and mesquite, and were making good time when the chain on one bike jumped the front sprocket. Dirt packed around the sprocket had forced the chain off. Now they had to work fast or face capture.

FIX IT — OR ELSE

The trooper dug into his fatigue pants' pockets and pulled out his emergency field maintenance kit. In the dim moonlight, he stripped the inspection cover off the left side of the engine and bared the dirt-clogged front sprocket. While his buddy kept watch, he cleaned the sprocket and slipped the chain back on.

Fifteen minutes later they were on their way—because they had been taught how to do on-the-spot field maintenance at the 10-day motorcycle reconnaissance course with the Scout

Seek out the enemy, the primary mission of the Scout Platoon, 2d Battalion, (Air Mobile) 7th Calvary, 1st Calvary Div. at Fort Hood, Texas. The bike riders have approached their objective and dismounted to begin their on-foot surveillance of the "enemy" positions.

Up and over the crest of a small hill, the motorcycle scout puts into his practice mission the lessons he learned in the 10-day bike riding course at Fort Hood. Fully clothed and wearing helmet and leather gloves, the rider has a lot in his favor should he wipe out on the rough terrain.

Platoon, 2d Battalion (Air Mobile) of the 7th Cavalry, 1st Cavalry Div. at Fort Hood, Texas. There, they had not only learned how to take care of themselves and their bikes in the field, but had received plenty of instruction in developing their riding skills under all kinds of weather and terrain conditions.

IDEA NOT A NEW ONE

The concept of motorcycle-mounted scouts is not new to the U.S. Army. There were motorcycle and sidecar scout units in service during World War I. However, the bikes dropped out of use with the advent of the Jeep and other light cross-country vehicles. The idea was revived in a staff study made by Captain Jay Hickey while attending the Infantry School at Fort Benning, Georgia. So, the 7th Cavalry's 90-day test project, initiated a year ago, has grown into a full-time program. More than 150 student riders have graduated from the training course, running up more than 125,000 miles of bike riding, mostly trail and cross-country.

First Lieutenant John C. Lewis, Officer-in-Charge of the Scout Platoon,

continued

Soggy feet can be a problem when crossing streams. Although the center rider is not demonstrating the best riding technique, he did make it across the creek. Note how snugly the front rider's pants legs are tucked into his boots. In addition to helmets, they wear heavy fatigue clothes and field jackets plus GI leather gloves with wool inserts. Moto-cross books, gauntlets, and kidney belts are on order.

DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

DEPARTMENT OF THE AIR FORCE

Hq Air Force Inspection and Safety Center
Norton Air Force Base, California 92409

Lt Gen LOUIS L. WILSON, Jr
The Inspector General, USAF

Maj Gen ERNEST C. HARDIN, Jr
Commander, Air Force Inspection and Safety Center

Brig Gen ROBIN OLDS
Director of Aerospace Safety

PUBLISHED IN COOPERATION WITH THE DEPARTMENT OF THE ARMY, AND THE DEPARTMENT OF THE NAVY

Dr. FRANCIS S. McGLADE
Acting Director of Safety
United States Army

RADM W. S. NELSON
Commander, Naval Safety Center

Col ALLEN J. DIEFENDORF
Chief, Safety Education Division

Capt. TOBIAS van ROSSUM DAUM
Editor

A1C BOB KAYS
Technical Editor

BOB ROGGE
Feature Editor

BOB LOWE
Editorial Ass't

DON KELLEHER
Art Director

TSgt HANK KRUEGER
Staff Artist

MSgt MIKE KEEFE
Staff Photographer

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THE EDITOR SPEAKS

DOUBLE CLUTCH

WELCOME ABOARD US ARMY!

We are happy to announce the United States Army will receive this issue of DRIVER magazine, as well as the fiscal year '74 issues (July '73-June '74). Action is also underway to obtain funds for the May and June '73 issues.

Our heartfelt welcome to the men and women of our highly versatile, mobilized, amphibious, and airborne fighting units. Addition of your numbers to those of the Air Force, Navy, Marines, Coast Guard, and more than 3,000 paid subscribers brings the magazine's readership up past the 2½-million mark. But more impressive is the fact that DRIVER is now available to all U.S. Armed Services.

In this initial "Army Issue" we've published the famed 7th Cav's "Air Mobile Motorcyclists" story. But that's just a starter. We'll give favorable consideration to publication of any safety-slanted operation/maintenance-type contributions submitted by Army personnel.

In DRIVER you'll find no safety sermons or slogans; just interesting and thought-provoking information that will help you to safely operate and maintain your car, trailer, motorcycle, boat, snowmobile, or what have you . . . interviews with leading authorities, rundowns on driving conditions in areas you may visit or be stationed in, photos of and tips from the popular Miss DRIVERs, news of the automotive world, do-it-yourself maintenance features, interviews with top racers, and other reader-requested items.

You are a part of this magazine now, so dig in and send us suggestions and/or contributions—or just let us know what you think of the mag.

Again, we are pleased to have you with us. We wish you many hours of happy reading and many miles of safe driving ahead. •

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One method of air transporting the bikes is shown here with three machines securely lashed to an iron pipe platform hung under a Huey helicopter. The bikes might carry up to 400 pounds of rider and equipment on an exercise. More recent experiments in this technique call for the bikes to be strapped to mounts on the chopper's landing skids.

Off and running, the recon platoon zooms out of an Army Chinook helicopter on a field training problem. Fully equipped, the men will scout "enemy" positions and radio their information to their own command post. Rapid air transportation can take the men and their bikes deep into unfriendly territory and return them upon completion of their mission.

continued

THE U.S. ARMY'S AIR MOBILE MOTORCYCLISTS

is an experienced trail rider. He is responsible for the training schedules that include classroom and garage work, safety lectures, and many hours in the saddle. Incidentally, the present-day 7th Cavalry is descended from Custer's regiment.

SAFETY RECORD

Lieutenant Lewis periodically updates the training program, and safety is the watchword in all the classes and field work, whether it concerns tool handling, riding techniques, daily vehicle inspections and maintenance, or the wearing of protective helmets and clothing. The program's good record speaks for itself: with the more than 150 men trained and well over 125,000 rough miles ridden, they have had only five accidents requiring hospitalization—and one of those was due to a trooper not fastening the chin strap of his helmet. Bruises are commonplace, serious injuries a rarity.

Night riding is an essential part of the training, and the troopers consider themselves real "Sneaky Petes" when it comes to slipping unobserved into enemy lines and getting out again. The bikes are not as noisy as you might think. Several times the platoon has ambushed night bivouacs and literally smoked them out; then made a getaway, leaving bewildered, angry, and smoke-blinded troops wondering just who or what hit them. Such attacks could be devastating in a shooting war where surprise is half the battle.

NO LIGHTS AT NIGHT

They ride at night without lights, and learn to interpret the "feel" of the front wheel as they go. Using lights would not only give them away, but would destroy their night vision and depth perception. Lieutenant Lewis tells his men to "let the front

continued

Bike riders discuss a maintenance problem in the motor pool before they start on a day's training. Expert advice, as well as maintenance service, is available from Sp4 Jacque and Pvt Levy, mechanics for the motorcycle platoon.

continued

THE U.S. ARMY'S AIR MOBILE MOTORCYCLISTS

wheel feel the way; don't try to rush things in the dark, not even when you think you know the terrain. Make haste slowly." He warns it is very easy to "ride off the edge of the world" at night.

A backpack radio is carried on all cross-country trips in case of a serious accident, and prompt medical attention can be flown to the scene in a "Life Saver" Huey chopper from Darnell Army Hospital at Fort Hood. Also, each man carries his personal first-aid kit.

SAFETY LECTURES

An important part of the training is a 3-hour safety lecture given by Captain Michael E. Menard, who works with the Motorsport Complex on the post. The color slide-illustrated talk is based on the National Safety Council's Driver Improvement Program, Defensive Driving Course, Motorcycle Supplement, and is aimed at street and road riding.

The troopers study III Corps' Manual 385-7, "Motor Cycle Safety," and a reprint from the Navy's FATHOM magazine, titled "Two-Wheel Logic." They also become very familiar with their bike manuals. But their most effective safety training comes from riding. They are encouraged to spend part of each riding class operating "all out" to test their skills to the maximum. "By doing this," says Lieutenant Lewis, "they keep increasing their abilities." He emphasizes the need for a man to stop after taking a spill to figure out why it happened. Then he must try the maneuver again.

"Practice, practice, practice," is the OIC's creed, and that of his enlisted instructors: Sgt James Murphy, Sp4 Michael Perry, Sp3 William Sandifer, and Sp4 John Shelton. Each man's performance is critiqued; he is told what he did wrong and what he did right, and is then sent out to try again. Bad riding tehniques are squelched before they become bad riding habits.

BASIC LAWS

The troopers learn there are two basic sets of laws governing motorcycle riding—the natural laws of centrifugal force and the man-made traffic laws. Centrifugal force tends to pull you to the outside of a turn, and you counter-balance it by leaning into the turn. Not enough lean, and you lose your turn; too much lean, and you get a quick close-up of the street.

They are taught the only safe time to use their brakes is when the bike is upright and traveling straight. Clamping on the binders in a turn results in a dump. They learn why the front brake does most of the work—the weight of bike and rider shifts forward when the brakes are applied. Riders learn just how much front brake they can use before locking the wheel, and soon learn that a locked rear wheel means skids and spinouts. Bike brakes, like auto brakes, should be "pumped" for the best slowing action.

GREASY HANDS

Quality maintenance is essential to the motorcycle training platoon. The bikes change hands every 2 weeks, and they are far from beautiful-looking machines. But they go, and go, because the men perform the daily maintenance. They are eager to ride, and don't mind the greasy-hands part of the course. "It's still cleaner than stable duty with the Horse Platoon," one corporal said. He was referring to the 1st Cavalry's 1865-equipped horse-mounted platoon that is used for recruiting and riding displays.

After each day's riding, the bikes are washed down and inspected for damage such as cracked frames, bent wheels, loose spokes, frayed control cables, chain condition and tension, fuel line condition, and tire condition and pressures.

The students may interrupt any lesson, in the classroom or the field, and ask questions. "You don't learn if you don't ask questions," they are told, and they get clear, concise answers.

BIKE MODIFICATIONS

Some changes were made on the bikes upon delivery. Rubber foot pegs were replaced with steel-toothed pegs for better gripping when the riders stand up. The rear shocks were replaced with heavy-duty types, and plastic fenders replaced the steel ones to reduce the possibility of rider injury in a spill. Spark arresters were fitted to the muffled exhausts to prevent woods and field fires in the hot summer weather. The stock handlebars are to be replaced with chromemoly bars without the standard crossbar. Chain guards were removed to reduce weight, and the men wear their pants' legs tucked tightly into their boots and secured with the laces. The moto-cross-type boots on order will give even more protection than do their regulation field boots.

The men are taught how to get rid of their machines if the going gets too wild to maintain control, and they are taught how to fall.

The riders check their machines and equipment every time they take a break. Cross-country riding is the greatest thing ever invented to untie knots, loosen straps, and dump things onto the ground. Frequent checks keep the equipment with the man and his machine. Even street riding can shake equipment loose.

TIMED-SPEED RIDE

Near the end of their training the troopers make a cross-country ride that carries them over country roads, fields, streams, and gullies at an average speed of 24 mph. They even dodge cattle, for a lot of Fort Hood is open range, and put into practice what they learned in the classroom and from their instructors during practice rides. The riders learn to concentrate not only on what lies immediately in front of their machines, but on the general terrain around them.

A particular hazard of cross-country riding is barbed wire fences—especially old ones that have fallen down. Winding a couple of yards of the stuff around an axle and ending up nose-down in the dirt is not uncommon.

STREET HAZARDS

The students' work also entails street riding, and they are thoroughly briefed on the hazards they can expect to meet. "Auto drivers just don't see bike riders," Captain Menard tells the men. "You have to make sure drivers do see you, by using the correct hand and light signals. Keep your headlamp burning," he advises; "a lighted bulb is cheap life insurance."

Troopers learn that the left wheel track of the lane in which they are riding is the safest place to be. Out there, the riders can be seen by motorists and are less likely to be forced off the road by passing vehicles. They are warned of the dangers of riding on the oil-slick centers of traffic lanes; and, when traveling in groups, they ride a staggered formation that gives them maneuvering space to evade a rider who might spill. The staggered formation also allows overtaking traffic more room in which to safely pass them.

THE BIG FOUR

Four rules for negotiating intersections are impressed on the troopers: Know, Slow, Show, and Go. **Know** the traffic rules, especially the "YIELD" rule; **slow** down when approaching an intersection, make sure you are seen; **show** your intentions with clear signals, and **go** when the way is clear.

continued

Cleaning out the dirt packed around the front sprocket, this bike rider has removed the inspection plate on his bike's engine to get at the trouble.

drive friendly

Lieutenant General George P. Seneff, Jr., III Corps Commander at Fort Hood, is a bear on discourteous driving. His post-wide "Drive Friendly" campaign encourages courteous driving by all hands, and is designed to reduce motor vehicle accidents. Courteous and cautious driving on Fort Hood pays off with less horn-honking and less nervous strain on everyone. The driver who keeps his cool, who extends courtesy of the road to other drivers, and who doesn't let himself get hot under the collar at the antics of the stupid driver, will be the driver who gets home safely.

General Seneff not only pushes his "Drive Friendly" campaign, but stands firmly behind the post's automotive clubs which have several hundred members. Fort Hood's sports car, hot rod, dirt riders, and go-kart clubs compete in many events with local civilian clubs. "Safety" is the byword of these clubs. Event competitors must wear helmets and protective clothing, and their vehicles undergo strict inspections before the competitions. There is an excellent moto-cross course on the post, and it is there the first of six 2-day elimination trials will be held to pick the six members for the 1973 Olympic International Six-Day Trials Team. The General has also directed that the post sponsor a competition motorcycle team. This group will concentrate its efforts on trials and enduro runs, with the object of qualifying Fort Hood riders for the Olympic team.

The word has gone out to the troops that the safe driver is not necessarily the fastest driver, but they can bet on seeing him show up at the finish line on a machine that is still running.

An adjustment is made in the field to the lower end of the clutch cable. Each rider carries an emergency field repair kit that includes pliers, Phillips screwdriver, adjustable wrench, chain links and rivets, chain tool, and a spare spark plug.

BIKE TIPS

The 10-day riding course at Fort Hood, while mostly concerned with trail and cross-country work, includes some riding and maintenance tips useful to the street rider. The hill-starting technique is strictly for the dirt rider; but adjusting bike controls applies to all riding, and DRIVER thinks both worth passing on.

HILL-STARTING—If you stall on a hill, your best bet is to go down to the bottom and try it again. Full throttle won't conquer a hill; once you get that rear wheel spinning, you aren't going anywhere. You have to learn your bike's best performance in each gear, and stick to those combinations of throttle and gears that will give you the most traction with the least wheelspin. If you are too far from the bottom to go back down, you can start your bike facing across the grade and angle your way up the hill. Go easy with the throttle, for that back wheel tends to slip downhill when it is gunned too hard.

HAND LEVERS—If street riding is your thing, you will want the positions of the throttle and clutch levers on the handlebars to be different from those used by the dirt rider who does a lot of standing up. Adjust the levers so your fingertips, wrist, and elbow make a straight line when you reach for them. This gives the most positive control.

BRAKE PEDAL—The pedal should be adjusted so that it is just under the foot resting horizontally on the peg. Then adjust the brake linkage so that it begins to engage the brake after about ½- to 1-inch of pedal travel. If you work the pedal up and down by hand, you can see what stops its upward movement. If it is adjustable, adjust it. If it is a fixed stop, and too high, you can build it up by slipping something over it; if it is too low, you can file it down. Sometimes you can bend the stop to get the brake pedal positioned exactly where you want it.

SHIFT LEVER—The lever should be set so that it is above the boot resting horizontally on the peg. You can adjust this lever by removing it from the splined shaft and repositioning it to suit your needs. Be sure the tightening nut is secure, and that there is a lockwasher under it. This tip could save you a mangled gear-box: some dirt riders drill a hole through the shift lever, just ahead of where it attaches to the splined shaft. Then, if the lever catches on the ground in a hard turn, it will snap off and possibly prevent a fatal spill.

CHAIN SLACK—Adjusting the slack in your bike's chain is most important. The chain must have some slack to allow the rear wheel to bounce up and down, and to take up some of the strain of starting from a dead stop. Check your bike manual for the correct amount of slack. To check the slack, put the gears in neutral and push up on the lower part of the chain. This rotates the front sprocket and passes the slack in the top part of the chain to the bottom, where you will do your measuring. If your bike has two separate chain adjusters at the ends of the rear swing arms, it is possible to adjust them so the wheel is not straight with the chain. This can cause the chain to jump off the sprocket. Turn each adjuster an equal number of turns, and then do some eyeballing. Both sprockets and the chain must be in one straight line.

continued

THE U.S. ARMY'S AIR MOBILE MOTORCYCLISTS

Lieutenant Lewis passed on a neat safety tip that applies while waiting at an intersection: "Kick your bike into neutral. Even though you are holding down the clutch lever, if that cable breaks, you are instantly shot out in that oncoming and sidecoming traffic."

Rain-riding is another bugaboo the troopers have to face. "If you are riding for pleasure," says Captain Menard, "don't ride in the rain unless you really have to. Even then, wait about 15 minutes and give the rain a chance to wash away the oil-slick on the road. Riding on rain and oil-slick streets is like riding on greased BBs."

The Army takes a dim view of riders who get traffic citations. Captain Menard stated emphatically, "You don't get tickets unless you violate traffic laws; and when you do that, you place your life in jeopardy." Riding in heavy traffic is considered more hazardous by the platoon than tearing off on a cross-country run with full field equipment.

SLOW, SLOW, S-L-O-W

The precise art of really slow bike riding is an important part of the 10-day course. They run "slow," 50-yard races, and the last man over the line wins. This teaches precision control of brakes and clutch, as well as balancing techniques, and the troopers enjoy the contests.

VISOR TIPS

The two-wheeled troopers do a lot of cross-country riding, which causes their visors to get dusty and dirty. They are taught that a clean visor is "sight and life." Both the wrap-around and the bubble-type visors are allowed. They drill several small holes in each side of the visor, outside the range of peripheral vision, to allow air to circulate and prevent fogging, and apply a good grade of auto wax to the outside to prevent rain streaks. And, the troopers know that rubbing the inside of the visor with a piece of raw potato will keep it clear if it does start to fog up.

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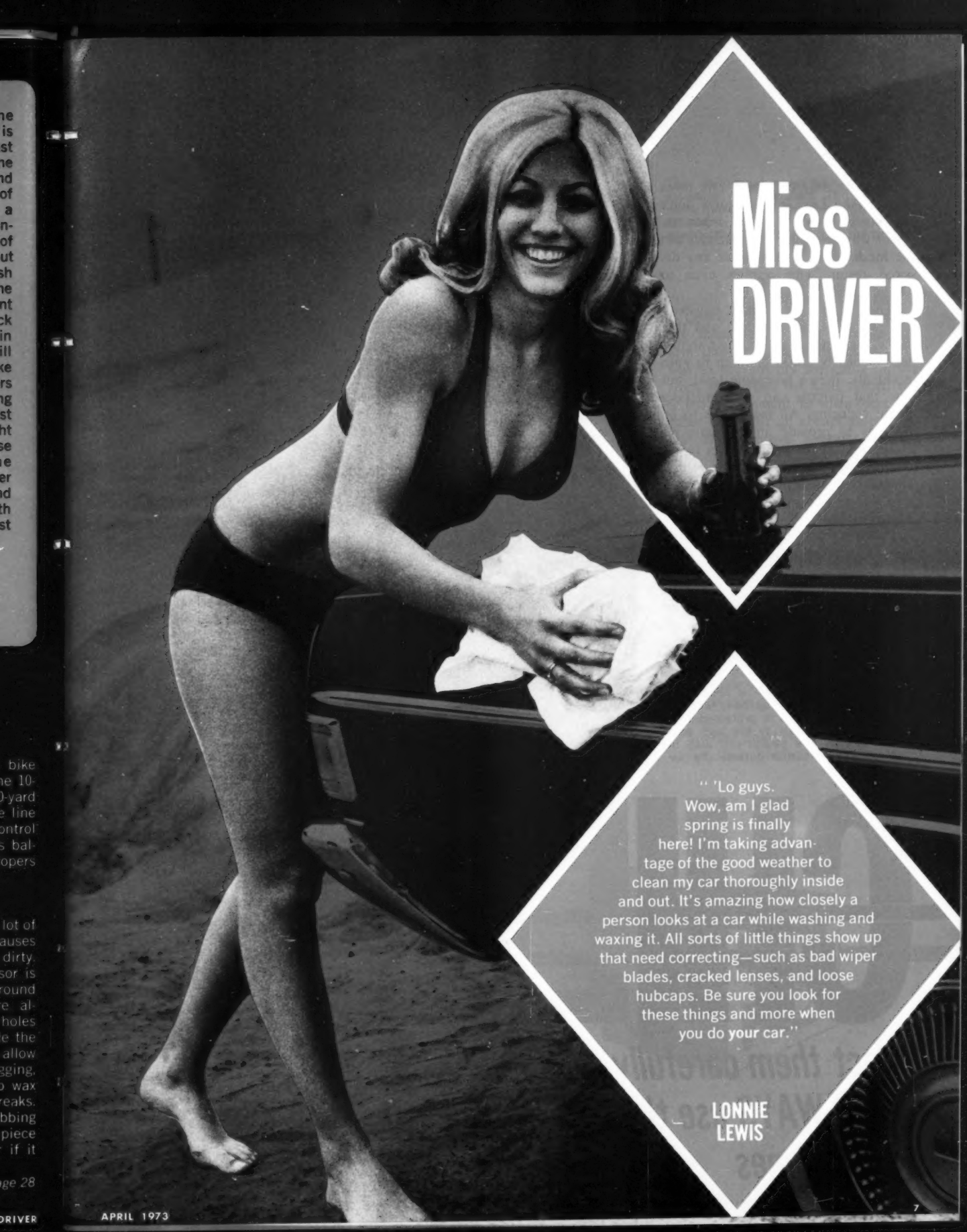
Miss
DRIVER
" 'Lo guys.
Wow, am I glad
spring is finally
here! I'm taking advan-
tage of the good weather to
clean my car thoroughly inside
and out. It's amazing how closely a
person looks at a car while washing and
waxing it. All sorts of little things show up
that need correcting—such as bad wiper
blades, cracked lenses, and loose
hubcaps. Be sure you look for
these things and more when
you do **your** car."
LONNIE
LEWIS

Somebody once said (we think it was Abe Lincoln), "Figures don't lie, but liars figure." This is just another way of saying that statistics can be modified to show almost any desired result. This applies even to traffic accident figures.

There is one sad statistic, however, that no one has modified, and that is the one concerning the tragic annual loss of nearly 3,000 children in auto accidents. It is a gruesome total, but one that parents can do something about reducing. All that needs to be done is to provide an adequate restraint system for each child or infant transported in a vehicle. Your youngsters have just as much right to a safe, injury-free ride as you, so why not give it to them?

Providing such restraint systems is neither expensive nor time-consuming. Would you send Junior out into the snow without his snowsuit and boots? Of course not! But, do you let him sit unsecured in the back seat or, worse yet, in the right front seat (the

This infant carrier, which is secured to the car seat with the lap belt, faces to the rear. Junior Miss is protected from impact with the dash by the high back of the carrier. The device can also be used as a child carrier outside the car.

CHILD RESTRAINTS

Select them carefully-- and ALWAYS use them for transporting the wee ones

This child seat must be used with a standard car seat belt. The child has some movement within the safety-padded structure, but won't be thrown forward against the dash if mom hits the brakes.

Another car company offers an infant safety carrier and a child's car seat similar to the others shown. The infant carrier faces the rear and has a self-contained harness to restrain the infant. It is secured to the car seat by the lap belt. The older child's car seat is also secured by the car's lap belt.

"suicide" seat) of the family car?

One of this writer's earliest motoring memories is of a parent's stiff arm slamming across my chest. This was to prevent my launching off the front seat when the light turned red at the last moment, or when there was other cause for an abrupt stop. Anyway, this primitive "restraint system," still commonly used today, is no good.

SEAT BELTS NOT ALWAYS ADEQUATE

Standard seat belts are worse than useless for children under 4 years of age, for their pelvic bone structures are not developed enough to sustain the forces involved in a collision. Also, seat belts are completely out of the question for children too young to sit up by themselves. Not even diagonal shoulder belts are suitable for young children, because the belts could slide up over the neck or face in a collision and become an additional hazard.

Smaller children are topheavy because their heads are much larger,

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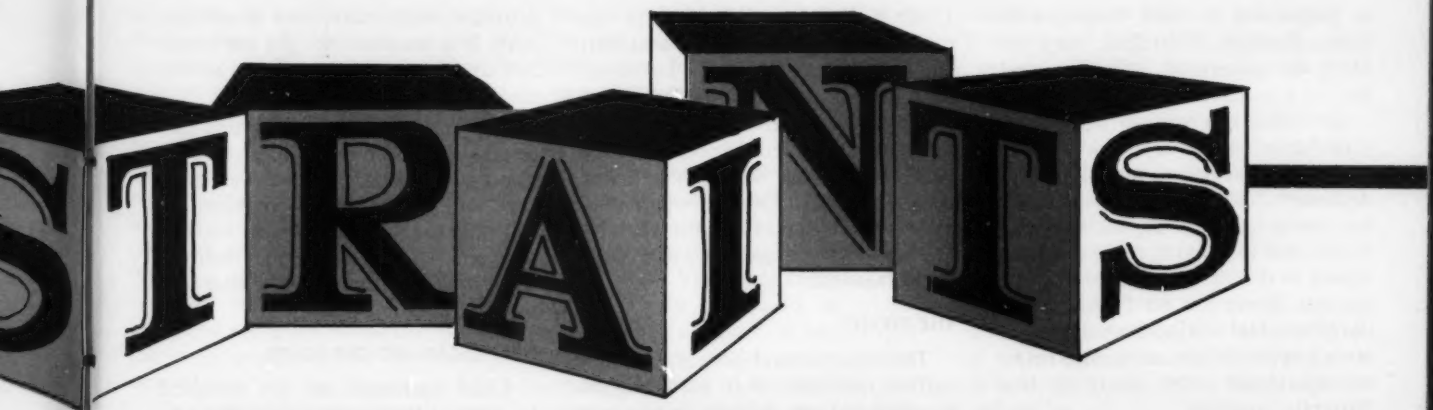


Happy-go-lucky kids in the back of the family station wagon with the rear window all the way down, or the tailgate open, are likely to get pitched out if dad hits the go pedal too hard, or if his car is rear-ended. Keep the back end of your station wagon closed, and keep the kids in their harnesses at all times.

in proportion to their bodies, than those of adults. Therefore, they are likely to somersault out of a seat belt in a sudden stop.

So—what can you do to help insure Junior's survival if you have an accident or are forced to make a sudden stop? There is a lot you can do, but much depends on his size and weight, for restraining devices are designed to these criteria, rather than to his age. There are no Federal Standards for child seating/restraining systems, but the devices mentioned below are considered to be among the best currently available.

Child-restraint equipment should meet the following criteria: distribute an impact over large areas of the child's body; sustain a static load of 1,000 pounds; attach either to the rigid car structure or to a seat belt that is anchored to the car structure; be constructed of materials free from injury-producing components such as sharp edges or hard corners; and prevent whiplash by bracing the child's head and neck. Quite often, manufacturers will label their product with its load-bearing capabilities as a guide to the customer.

THE INFANT

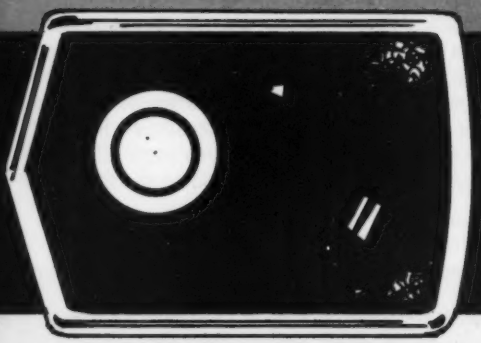
There are several brands of infant carriers available that are designed to safely restrain children up to about 8 months of age—or to the time when he can hold up his own head. One model (illustrated on page 8) faces backward on the car seat and provides back, neck, and head support. It is secured with the car's seat belt and features a harness to secure the infant.

A padded bassinet or car bed can be used on a car seat. Place the bassinet front-to-rear, extend the front legs, and use seat belts to secure it. Put the car bed lengthwise on the seat and secure with a seat belt. A see-through net can be put over the top for additional safety.

HARNESSES AND CAR SEATS

Child harnesses are not designed to restrain the infant child. Once he has grown out of the bassinet stage, he should be able to use either a harness or a child's seat. Harnesses cost less and allow more freedom of move-

These youngsters in the back of this pickup truck are headed straight for trouble if dad slams on the brakes. The bikes in there with them are potential hazards, too, if the brakes go on hard.



Little miss will have her noggin rapped against the hard playpen bars when mom tramps hard on the binders. Children should always be firmly but comfortably restrained when riding in cars.

ment than do car seats, but generally don't permit the child to see out of the windows. A point to remember is that all webbing that comes in direct contact with the child's body should be a least 1½ inches wide. Narrow straps can injure the child's soft body tissues. Harnesses that are secured by looping a strap around the back of the car seat are useless. The seat back does not provide safe anchorage in a crash. A strap looped over the seat back and anchored to the car floor in the same manner as the seat belts is needed.

Crash tests have shown many child car seats to be inadequate. Flimsy construction and incorrect positioning of the harness straps can actually contribute to injuries. Devices that raise the child's head above the back of the car seat are dangerous because they allow the child's head to strike the dash in the event of a collision. Those seats which simply hook over the back of the car seat, and those equipped with make-believe steering wheels, are among the most dangerous.

Children who have outgrown car seats, usually between the ages of 3 to 5 years (dependent upon their size), should be placed on a firm cushion and strapped in with a standard lap belt while sitting upright against the back of the seat. *The belt must not be allowed to ride up across the child's abdomen.*

And, please, don't ever strap in Junior and his brother or sister with one seat belt. They will have too much slack, and both can get thrown forward and hurt in an accident.

UNRESTRAINED CHILDREN ARE VULNERABLE

Loose children in any moving vehicle are the prime cause of child injuries and deaths. An unrestrained child is liable to be thrown violently forward any time the car's brakes are slammed on. Children riding in the cargo area of trucks are especially prone to injury; they have no security at all in a collision, and are exposed to bare metal and many sharp edges and angles.

Keep your children restrained and safe in the car, and you will have them around for years and years. . . a lifetime. ●

REC VEHICLES ARE FUN

Tips for modern nomads

Spring, summer, fall and winter —all seasons are recreational vehicle seasons, but most activity occurs in the warmer months. These fun vehicles have been with us a long time, and sales figures show an ever-increasing portion of the military population is getting to know and enjoy them. They come in all shapes and sizes, and include trailers, campers that fit on pickup truckbeds, and complete homes on wheels. Auto dealers and rec vehicle dealers offer everything from simple slip-on roofs for pickup truckbeds to rolling homes that are lavishly equipped for your comfort and convenience. The styles, accommodations, and equipment available fall in a great price range. We thought a rundown of the unusual characteristics of these fun vehicles, and the extra equipment you might need, would be appreciated.

Driving a pickup/camper, or towing a trailer, involves some different operating conditions with which you might not be familiar. In all cases, if you take it easy and do some practice driving before you head out, you will be a happier and safer driver.

CAR/TRAILER HITCHES

Owning the right car/trailer hitch combination is half the battle; using it correctly is the other half. The most important thing to consider when you are in the market for a trailer of any size is the type of hitch you will need. There are three major types, and each is designed for a specific kind of towing.

You can buy a bumper hitch that clamps onto the rear bumper of your car, and use it for occasional towing of a lightweight Class 1 trailer. (See list of definitions for trailer weight classes and other terms.) This is strictly a once-in-a-while hitch, and is *not* recommended for long-distance towing.

The frame-mount hitch is better; but, like the bumper hitch, it adds to the rear-end load on your car. Too much rear-end load raises the front of the car and adds to your driving problems, changes the aim of your headlights, and is bad for the rear springs.

The best hitch of all is the load-equalizer hitch that distributes the towed weight evenly over the towing car's frame. With this hitch you can safely tow any trailer load your car is built to handle, and you will be assured of a safe and balanced load combination. If you aren't sure just what the load combination for your car should be, check with the dealer.

When you buy a frame-mount or a load-equalizer hitch, have a pro shop install it. There is no nicer feeling than knowing your hitch is going to stay put.

TRAILER TOW PACKAGES

Most new car and truck dealers offer trailer-tow packages as optional equipment. For the money you'll spend, you can't go wrong. Normally, these packages include anti-sway bars; a load equalizing hitch; heavy-duty tires, wheels, and suspensions; and larger engines, brakes, radiators, and fans. Also, you will probably find power steering and power brakes offered along with heavy-duty transmissions, both manual and automatic. You can add adjustable air shocks, if you like. Anything that increases the roadability and stability of the car/trailer rig is desirable.

A bug screen on the grille is another smart idea, and will keep your radiator free of insects and small rocks.

GETTING ACQUAINTED

Getting to know your car/trailer rig is part of the fun of owning it. When you tow a trailer you will have to cope with driving conditions and handling characteristics unlike those faced while driving an unencumbered car. Even if you are an old hand at trailering, you need to learn all about a new rig before heading for the open

The "buddy" system is best when traveling on little-used roads or cross-country. Your buddy can get help if you get stuck, and you can do the same for him.

road. If you have access to an empty parking lot, practice your driving and handling there.

Learn how to back a trailer into a limited space. Remember that when you back up a trailer, you have to turn the steering wheel in the direction you want the trailer to turn, *not* the direction you want your car to turn.

Another good point to remember when backing a trailer is to have somebody standing outside to guide you. It is impossible to see directly behind the trailer, and if you hear *crunching* noises. . .it's too late.

Get to know just how much more turning diameter you will need to make a corner safely, and practice using the brakes, getting a "feel" for the extra weight.

BRAKES AND TOWING

Trailers come with two kinds of brakes, *surge* and *electric*. The electric brakes are operated by a lever on the steering wheel column. Remember to use the trailer brakes first, or the trailer might jack-knife (swing around sideways). Surge brakes are applied automatically when the weight of the trailer pushes forward on the hitch. No matter what type of brakes you have, learn how they affect your vehicle and use them with caution.

Towing a 3,000-pound trailer is going to greatly affect your car's speed, stopping ability, maneuverability, and gas mileage. Many states have special speed limits for trailers, so we've included a handy chart for your information. Jot down the info you need, and check it when you come to a state line.

Towing all that dead weight is going to mean you will have to use the shift lever more often on your automatic transmission, or stir your manual shift stick with determination. Remember to downshift before you head down a hill, and let the engine do its share of the braking.

TURN SIGNALS

Your trailer comes equipped with rear lights, stop lights, and possibly clearance lights as well. It also has turn signal lights. The trick is to remember that when you make a turn with a trailer behind, you need more room, and it is advisable to use your turn signals well in advance.

CHECKLISTS

A checklist is as important as a full gas tank, and will save you time, money, and trouble. Every rec vehicle driver should have one that fits his own needs. We've included a good checklist, but perhaps there are some things you will want to add. Keep yours in a plastic cover, and put it somewhere in the driving compartment where you will just have to see it—and use it—before starting on a trip (perhaps lying on the driver's seat, or propped up on the steering wheel).

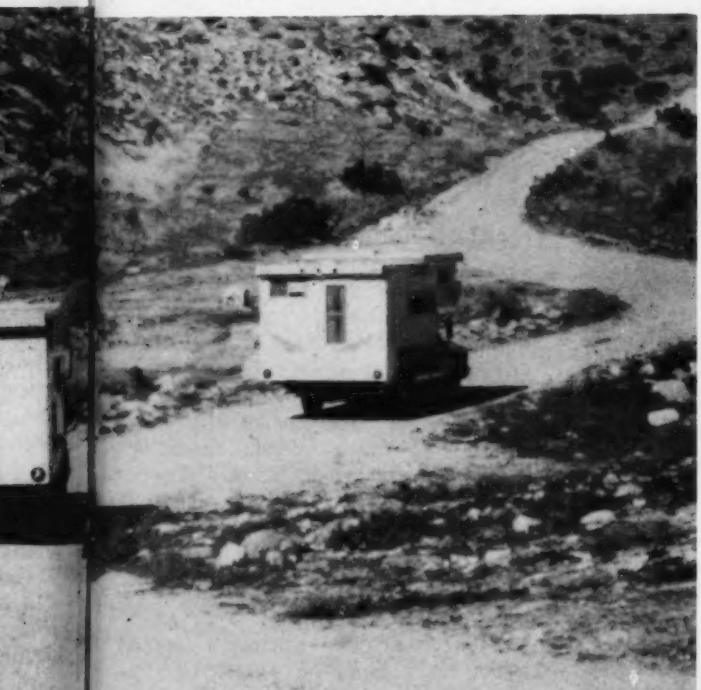
Our checklist also includes the propane tank in your rec vehicle. Be sure the tank compartment is well ventilated, top and bottom. Propane gas is heavier than air; so, if your tank vents any gas, it will settle to the bottom of the compartment where it could create a hazard. Tanks mounted on the trailer fork have no such problem, of course.

Your checklist should include *everything* on the car and trailer that must be looked at before a trip. An hour spent with the checklist is an hour well spent. The sad cry of "I forgot about that!" has no place in happy rec vehicle operations.

Have your wife go over the checklist, too. Then she can learn all about it, and will feel much happier when she personally sees to it that even the eggs are in a safe place.

It is dangerous, plus illegal in many states, to have anyone riding in a

continued



Big rearview mirrors on both sides of the cab are a must for trailering or 4WD operations. Keep them clean and in good condition.

Boondocking is a half the fun of 4WD traveling. A well-equipped, mechanically sound vehicle is your best bet for total enjoyment of Nature's seldom-seen beauty.

continued

REC VEHICLES ARE FUN!

trailer being towed, so make sure all the kids are in the car before you start.

FOUR-WHEEL DRIVE REC VEHICLES

Four-wheel drive (4WD) rec vehicles share a growing percentage of the fun; you can explore places with a 4WD vehicle that you would have to pass up with a car/trailer rig. But, driving a 4WD rec vehicle takes a different set of skills and some different know-how, because a lot of your traveling is likely to be on poor roads . . . or on no roads at all.

Once again, a checklist is essential, and the accompanying sample list can be changed to suit your own needs.

Since a lot of 4WD travel is done off-the-road, you should use the "buddy" system; travel in pairs or larger groups. There is safety in numbers; if someone has a breakdown, an accident, or other trouble, help will be available. Traveling on your lonesome through deserted, roadless, country is sticking your neck out.

DON'T BE SHIFTLESS

Running a 4WD rec vehicle up hill and down dale calls for good driving skills and a lot of concentration. If your 4WD vehicle has an automatic transmission, use the low range for uphill work; also, use the low range and let the engine take some of the strain off your brakes when going downhill. If you have a manual shift, make good use of it. If you can possibly avoid it, don't downshift going uphill. You could stall out and have a heck of a time getting in motion again.

FRONT WHEELS "FREE"

A lot of 4WD rec vehicle drivers forget to take the front wheels out of "drive" when they get back to the concrete. If you forget, and have to make a quick stop, the engine will exert its braking effect on the front wheels as well as the rear. This could cause a spin-out, so make sure those front wheels are running free when you don't need 4WD.

As with a car and trailer, practicing on an empty parking lot before you head out for the boondocks is real insurance. Learn how much more room your 4WD needs to make a turn, and how much more time and space it takes to stop. Practice with a load, and you will become acquainted with your vehicle's capabilities and limitations.

CAMPER/PICKUPS

Quite a few camper/pickup operators buy extra-large tires for better off-the-road traction. Some buy dual rear wheels. Dealers offer packages that include heavy-duty suspensions. brakes, and wheels. You can have extra gas tanks installed to increase your cross-country range—a good idea.

If it is legal in your state, a spotlight is a sure-fire safety item that you can use at night to pick out the really bad spots in the road that are out of range of your headlamps. It can also come in handy for signaling.

Something to keep in mind when you are loading up your rec vehicle is the gross vehicle weight. (See accompanying list of definitions). The GVW should not exceed the manufacturer's specifications, and should *never* exceed the load capabilities of your tires.

MAINTAIN YOUR REC VEHICLE

Your rec vehicle—whether a car/trailer rig, a home on wheels, or a

4WD—needs maintenance. Routine maintenance on a trip is a must. It doesn't take much time, and may often spot trouble before it becomes a big thing. Keep a sharp eye on the gas gage. A rec vehicle with instruments that show water temperature, oil pressure, and amperage is a lot safer than one with light indicators only. A gage will tell you when trouble is about to happen; a light tells you it *has* happened.

Pull a walk-around inspection each time you make a stop. Cross-country travel can jolt a lot of things loose, and now is the time to re-secure these items. If the engine starts to overheat, stop and open the hood. It may cool down if you let it run at a fast idle. If you've lost the coolant (perhaps a rock through the radiator), you have a problem. This is one reason why it is best to travel with a "buddy." Check the fan belt, too. You do have a spare, don't you?

You may not have too much use for your outside mirrors while you are in the boonies, but don't forget them on your walk-arounds. You'll need them when you get back to civilization—and a broken mirror is not too useful.

HAVE A BALL

Rec vehicle driving can be fun for everyone. All it takes is some common sense, a good checklist, and remembering that off-the-road driving is a lot different than highballing down the freeway.

If you are a newcomer to rec vehicle operation, talk with those who have had some experience; you can pick up a lot of useful hints. Join a rec vehicle club if you can. These clubs are often sponsored by a rec vehicle manufacturer, and have a wealth of information on tap. And sometimes they offer special buys on vehicles and equipment. •

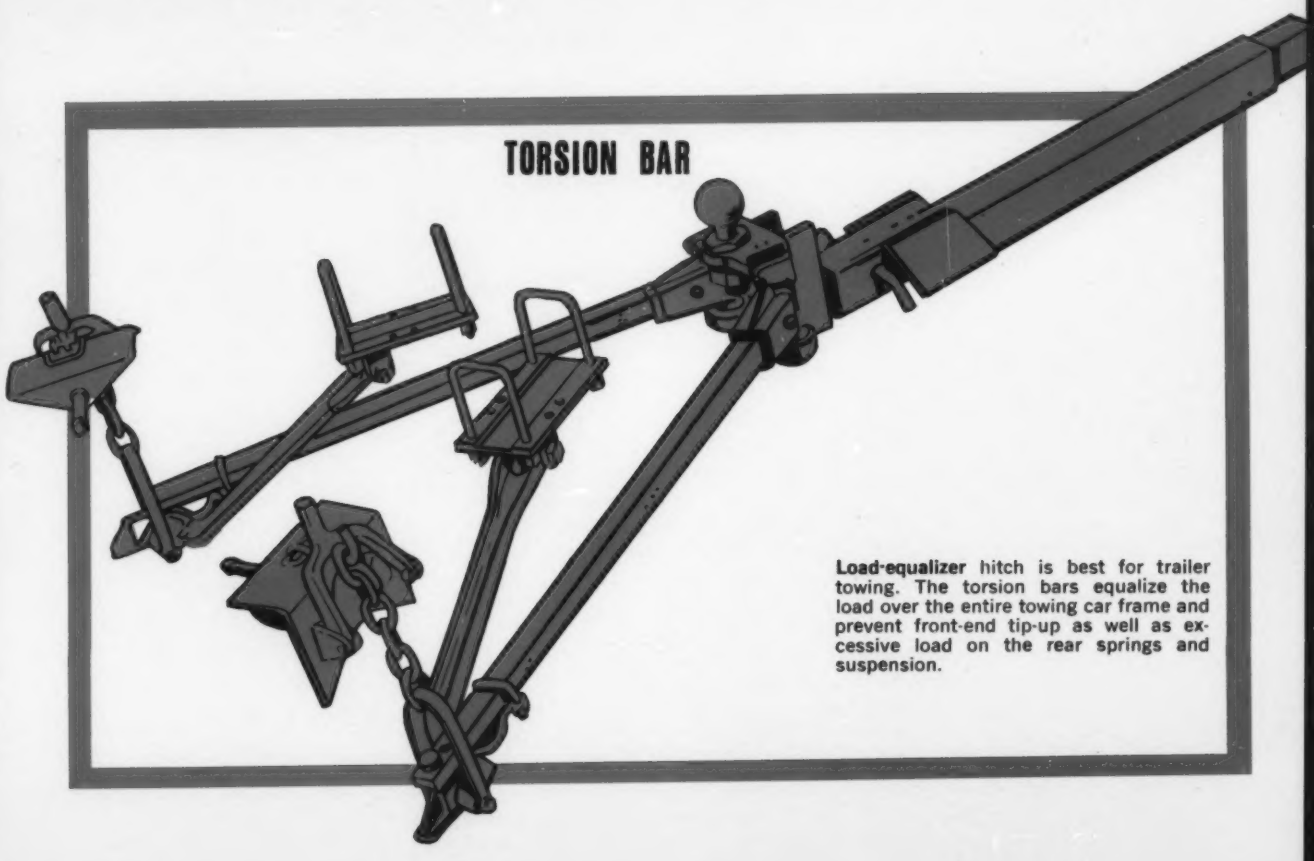
DEFINITIONS

GROSS VEHICLE WEIGHT (GVW — The weight of the vehicle plus the load it can safely carry. For example, a 4,000-pound vehicle with a 7,500-pound GVW will carry a 3,500-pound payload.

TRUCKS—½-ton pickup: A light-duty truck capable of carrying 1,300 to 1,600 pounds, depending on types of springs, tires, and axles. ¾-ton: A heavier-duty truck capable of carrying 2,000 to 4,000 pounds; again, depending on types of springs, tires, and axles. One ton: Usually a bedless truck for housecar use up to 10,000 pounds GVW.

AXLE RATIO—A high axle ratio denotes a low number, such as 2.41 or 2.73. It gives low engine rpm and better economy at cruising speed, with somewhat lower acceleration and less pulling power. A low ratio (higher number) gives quicker acceleration and better mid-range pulling power, but less economy, higher engine rpm, and more noise level at cruising speed. A 3.55, 3.73, or 4.1 ratio is better for

continued



Load-equalizer hitch is best for trailer towing. The torsion bars equalize the load over the entire towing car frame and prevent front-end tip-up as well as excessive load on the rear springs and suspension.

towing than a 2.41 or a 2.73. Engine size determines what ratio you'll need; larger engines can handle higher ratios while towing.

LIGHT TRAILERS (Class 1) — 1,000 to 2,000 pounds loaded; includes most lightweight utility trailers.

MEDIUM TRAILERS (Class 2)—2,000 to 3,500 pounds loaded; includes travel and outboard cruiser trailers.

HEAVY TRAILERS (Class 3) — 3,500 to 6,000 pounds loaded.

TONGUE WEIGHT—The weight exerted upon the hitch ball by the trailer tongue; usually 12- to 15% of the total trailer weight.

HITCH WEIGHT—Total weight affecting downward pressure on hitch ball (tongue weight plus trunk load).

DRAWN WEIGHT—Trailer weight minus tongue weight.

The home on wheels provides full living comfort and convenience to family groups, and are now standard production items for several auto manufacturers. This model features a six-wheel braking system, steel peripheral frame, aluminum body cage with aluminum side and top panels, electricity and water hook-ups, and excellent views for the driver and front passenger.

This happy family is all set for a pleasant weekend in the great outdoors. Their station wagon and the foldaway trailer that expands to full size will provide them with ample weather protection as well as mobility.

CHECKLIST

LOADING

Water tank	full
Tool kit	stored
Water hose	stored
Fire extinguisher	checked
Fishing tackle	stored
Guns & ammo	stored
Camera & film	stored
Clothing	stored
Radio	stored
Charcoal & lighter	stored
Clothesline & pins	stored
110-volt extension cord	stored
Food	stored
First aid kit (full)	stored
Matches	stored

EXTERIOR

Mirrors	installed & adjusted
Tire pressures (incl spare)	AOK
Breakaway cable	installed & checked
Hitch ball	pin installed & locked
Tension bars	locked
Safety chains	installed
Electrical umbilical cord	installed & locked
Front jack	retracted
Leveling jacks (4)	removed & stored
Propane tank	no more than 80% full
Front-window gravel shield	down & locked
Windows	closed
Water hose	stored
Sewage system	capped & hose stored
Water heater	off
110-volt cord	stored
Trunk	locked
Chocks	removed & stored
Lights, turn signals, running lights, stop lights	AOK

INTERIOR

Refrigerator (if propane—turn off)	door latched
Stove	pilots off, mains off
Heater	off
Lights	off
Loose items	NONE
Roof vent	closed
Entrance door	locked
Step	retracted
Trailer door	free to open

SET UP

Chocks	in place
Unhitch	do it
Leveling jacks	in place
Water	hose connected
Electricity	plugged in & grounded
Sewage system	hose connected

FOUR-WHEEL DRIVE CHECKLIST

Check safety and emergency gear **before** starting a trip.

- Jack
- Seat belts/harness
- Fire extinguisher
- First aid kit (full)
- Spare parts/tires*
- Tool kit
- Flashlight (spare bulb, fresh batteries)
- Tow chain
- Wheel chains
- Tire gage
- Compass
- Sleeping bag(s)
- Emergency rations
- Drinking water
- Owner's manual
- Snakebite kit
- Sunglasses
- Shovel
- Flares

***Should include at least one headlamp and spare bulbs for other lights; fuses, fan/generator belts, radiator sealant, can for radiator water, and a siphon hose.**

RULES FOR THE ROAD
For Travel Trailers and Other Recreational Vehicles

	SPEED LIMITS (1)			MAXIMUM DIMENSIONS			REQUIRED EQUIPMENT											
STATE OR PROVINCE	DAY	NIGHT	BUSINESS	RESIDENTIAL	LENGTH (11)	WIDTH	HEIGHT	BRAKES, IF WEIGHT IS OVER:	SAFETY CHAINS	STOP LIGHTS	TAIL LIGHTS	CLEARANCE LIGHT	LICENSE LIGHT	REFLECTORS	FLARES	TURN SIGNALS	OTHER	RIDING PERMITTED IN TRAILER	OVERNIGHT OFF-ROADWAY PARKING ALLOWED (13)
ALABAMA	60	50-60	20	25	55′	8′	13′6″			•	•	•	•	•	•	•	Safety Glass	Yes	(2)
ALASKA	50-70	50-70	AP	AP	60′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes
ARIZONA	65	60	25	25	65′	8′	13′6″	1500	(5)	•	•	•	•	•	•	•		Yes	Yes
ARKANSAS	60	60	30	30	60′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes
CALIFORNIA	55	55	25	25	60′	8′	13′6″	1500		•	•	•	•	•	•	•		No	Yes (12)
COLORADO	60-70	60-70	35	35	65′	8′	13′6″	1500		•	•	•	•	•	•	•		No	No
CONNECTICUT	AP	AP	AP	AP	55′	8′6″	13′6″	3000		•	•	•	•	•	•	•	Safety Glass	No	No
DELAWARE	AP	AP	AP	AP	65′	8′	13′6″	2000		•	•	•	•	•	•	•	Safety Glass	No	Yes (22)
DISTRICT OF COLUMBIA	25	25	25	25	55′	8′	12′6″	3000		•	•	•	•	•	•	•		No	No
FLORIDA	AP	AP	AP	AP	55′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes (6)
GEORGIA	60-70	50-65	35	35	55′	8′	13′6″	2500		•	•	•	•	•	•	•	Safety Glass	No	Yes
HAWAII	AP	AP	25	25	65′	9′	13′6″	3000		•	•	•	•	•	•	•	Safety Glass	No	No
IDAHO	60	55	AP	AP	60′	8′	14′	1500		•	•	•	•	•	•	•		Yes	Yes
ILLINOIS	55	55	30	30	60′	8′	13′6″	3000		•	•	•	•	•	•	•	Safety Glass	No	No
INDIANA	65	65	AP	AP	55′	8′	13′6″	3000		•	•	•	•	•	•	•		Yes	Yes
IOWA	55-65	55-65	20	25	55′	9′	13′6″	3000		•	•	•	•	•	•	•		Yes	No
KANSAS	70	60	20	30	65′	8′	13′6″	3000		•	•	•	•	•	•	•	Safety Glass	No	No (3)
KENTUCKY	60	50	AP	AP	55′	8′	13′6″	(5)	(5)	•	•	•	•	•	•	•		Yes	Yes (4)
LOUISIANA	60	50	AP	AP	65′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes (22)
MAINE	45-AP	45-AP	25-AP	25-AP	58′	8′6″	13′6″			•	•	•	•	•	•	•		No	No
MARYLAND	AP	AP	AP	AP	55′	8′	13′6″	1500		•	•	•	•	•	•	•		No	No
MASSACHUSETTS	50	50	30	30	(15)	8′10″	13′6″	(16)		•	•	•	•	•	•	•		No	Yes (6)
MICHIGAN	50-70	50-70	25	25	55′	8′	13′6″	1500		•	•	•	•	•	•	•		Yes	No
MINNESOTA	65	55	30	30	55′	8′	13′6″	1500		•	•	•	•	•	•	•	Safety Glass	Yes	No
MISSISSIPPI	65-70 AP	65	AP	AP	55′	8′	13′6″	2000		•	•	•	•	•	•	•			
MISSOURI	65-70	60-70	AP	AP	55′	8′	13′6″	No		•	•	•	•	•	•	•		Yes	Yes
MONTANA	50	50	AP	AP	60′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes
NEBRASKA	50	50	20	25	65′	8′	13′6″	2000		•	•	•	•	•	•	•		Yes	Yes
NEVADA	AP	AP	AP	AP	70′	8′	Any	1500		•	•	•	•	•	•	•	Safety Glass	No	Yes (7)
NEW HAMPSHIRE	45	45	AP	AP	55′	8′	13′6″	3000		•	•	•	•	•	•	•		No	No
NEW JERSEY	50	50	25	25	45′	8′	13′6″	(21)		•	•	•	(17)	•	(17)	(17)	(17)	Safety Glass	Yes	Yes
NEW MEXICO	60-AP	50-AP	25	25	65′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes (8)
NEW YORK	55	55	AP	AP	55′	8′	13′6″	1000		•	•	•	(17)	•	•	•		No	No
NORTH CAROLINA	45	45	20	35	55′	8′	13′6″	1000	(5)	•	•	•	•	•	•	•		Yes	Yes
NORTH DAKOTA	60-AP	60-AP	25	25	60′	8′	13′6″	All		•	•	•	(17)	•	•	•		No	Yes
OHIO	60-70	50	25	35	65′	8′	13′6″	2000		•	•	•	•	•	•	•		Yes	No
OKLAHOMA	65	55	AP	AP	65′	8′	13′6″	3000		•	•	•	•	•	•	•		Yes	Yes
OREGON	55	55	20	25	60′	8′	13′6″	(9)		•	•	•	•	•	•	•		No	No
PENNSYLVANIA	55-60	55-60	AP	AP	55′	8′	13′6″	3000		•	•	•	•	•	•	•		No	Yes
RHODE ISLAND	60-AP	45	25	25	55′	8′6″	13′6″	4000		•	•	•	•	•	•	•		No	No
SOUTH CAROLINA	55-70	50-65	25	30	60′	8′	13′6″	3000		•	•	•	•	•	•	•		Yes	Yes
SOUTH DAKOTA	70	60	30	30	60′	8′	13′6″	(21)		•	•	•	(17)	•	•	•		No	Yes
TENNESSEE	50-75	50-75	AP	AP	55′	8′	13′6″	1500		•	•	•	•	•	•	•		Yes	No
TEXAS	(18)	(18)	AP	AP	55′	8′	13′6″	(21)		•	•	•	•	•	•	•		No	Yes
UTAH	AP	AP	25	25	60′	8′	14′	2000		•	•	•	•	•	•	•		Yes	Yes (6)
VERMONT	50-AP	50	AP	AP	55′	8′6″	13′6″	1500		•	•	•	•	•	•	•	Fire Ext.	No	No
VIRGINIA	45-55(19)	45-55(19)	AP	AP	55′	8′	13′6″	3000		•	•	•	•	•	•	•		No	No
WASHINGTON	(20)	(20)	25	25	65′	8′	13′6″	(21)		•	•	•	(17)	•	•	(17)		No	No
WISCONSIN	70	60	AP	AP	60′	8′	13′6″	3000		•	•	•	•	•	•	•		No	No
WEST VIRGINIA	50-70	50-70	25	25	55′	8′	13′6″	3000	(5)	•	•	•	•	•	•	(5)		Yes	Yes (4)
WYOMING	65-75	65-75	20	30	75′	8′	14′	3000	(5)	•	•	•	•	•	•	•		Yes	No
ALBERTA	AP	AP	AP	AP	65′	8′6″	12′6″	2000		•	•	•	•	•	•	•		No	(10)
BRITISH COLUMBIA	50	50	AP	AP	60′	8′6″	12′6″	3000		•	•	•	•	•	•	•		No	No
MANITOBA	60	60	30	30	65′	8′6″	13′6″	2000		•	•	•	•	•	•	•	Safety Glass	No	Yes
NEW BRUNSWICK	60	60	30	30	65′	8′6″	13′6″	3000		•	•	•	•	•	•	•	Safety Glass	No	Yes
NEWFOUNDLAND	AP	AP	AP	AP	65′	8′6″	13′6″	(16)		•	•	•	(17)	•	•	•			(10)
NORTHWEST TERRITORIES	60	60	AP	AP	65′	8′6″	13′6″	1500		•	•	•	•	(5)	•	•	(5)	Safety Glass	No	(10)
NOVA SCOTIA	60	60	30	30	65′	8′6″	13′6″	4000		•	•	•	•	•	•	•			No	Yes (8)
ONTARIO	50	50	30	30	(15)	8′6″	13′6″	2999		•	•	•	•	•	•	•			No	Yes(12)
PRINCE EDWARD ISLAND	60	55	30	40	70′	8′6″	14′6″	8000		•	•	•	•	•	•	•			Yes	Yes
QUEBEC	50-70	50-70	AP	20-30	65′	8′6″	13′6″	3000		•	•	•	•	•	•	•		Safety Glass	No	(10)
SASKATCHEWAN	50-AP	50-AP	AP	AP	65′	8′6″	13′6″	3000		•	•	•	•	•	•	•			No	Yes (4)
YUKON	50-60 AP	50-60	AP	AP	70′	8′6″	13′6″	1500		•	•	•	•	•	•	•		Safety Glass	No	Yes

NOTES:
AP—As Posted
(1)—Posted speed limits always take precedence over Statutory Speed Limits
(2)—Not at roadside parks
(3)—Yes in rest areas with toilets
(4)—Not at roadside parks and rest areas
(5)—Recommended but not required
(6)—Not on limited access or State Highways
(7)—In rural areas, not on State Highways
(8)—At rest areas
(9)—Trailers over 8′ wide, 45′ long or combination length (car and trailer) 60′
(10)—Only in designated areas
(11)—Trailer and towing vehicle without permit
(12)—Except when otherwise posted
(13)—Parking never allowed along limited access expressways or freeways, except when indicated above at rest areas
(14)—Additional 6″ is allowed for mirrors
(15)—Maximum length for travel trailer without permit is 33′ in Mass. and 35′ in Ontario
(16)—Brakes not required if towing vehicle foot brakes will stop from 20 mph within 30′ and hand brake within 80′
(17)—Required on vehicles 80″ or more in width
(18)—60 mph day and 55 mph night if overall length is 32″ or less, excluding tow bar or weight less than 4500 lbs; otherwise 45 mph
(19)—Same as passenger cars if trailer weight does not exceed 2500 lbs
(20)—Truck speed limits when towing, generally 10 mph less than passenger cars
(21)—Required if weight of trailer exceeds 3000 lbs or 40% of towing vehicle
(22)—With parking lights or flares

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"I've spent over ten thousand dollars on that Corvette, and it still won't handle!" Don's loud complaint could be heard from one end of the pits to the other at Riverside International Raceway. Don's mechanic, Jim, was frustrated. It was the morning of the race, and the Corvette was still 5 seconds a lap slower than our Cobra. "Well," Jim asked, "What do you want me to adjust now? Is it oversteering or understeering?"

"It just won't handle," Don bellowed. "It goes through the corners funny. What I've got is a ten-thousand-dollar plastic pig. Fix it, Jim! Put on stiffer sway bars, turn down the shocks, jack some weight onto the left, and lower the tire pressure in the front by 4 psi."

Don came over to where I was checking the timing on our Cobra. "Some mechanic I've got," he grunted. "I've spent a fortune on suspension parts, and he can't adjust them so the car will handle decently."

"You've got to understand," I replied, "that adjusting suspensions is a very exacting business. You have to know precisely how much oversteer or understeer must be produced, and then which adjustments to make."

"I suppose you're right," he said, and then asked, "Uh, by the way, what are understeer and oversteer?"

Had Don understood the dynamics of automobile handling, he could have accurately described the cornering characteristics of the Corvette to his mechanic. Then the proper adjustments could have been made, and his car would have been much quicker and much safer.

So, before you set out to improve someone else's engineering effort, be sure of what you want to achieve and what effect the adjustments you intend to make will have on your car's handling.

The terms "oversteer" and "understeer" are frequently heard in the racing pits, but are often misunderstood. They describe the performance of a chassis through a corner, *not* what the driver does.

Dissimilar front and rear suspension geometry and degrees of stiffness, as well as unequal front and rear tire pressures, cause the weight transfer and roll center to differ at the two ends of the car. As a result, the two ends develop different amounts of traction in a corner, and one end slides or "drifts" outward more than the other.

A car oversteers if the front end turns too sharply into the corners, and the driver has to countersteer to keep from driving off the road. Understeer, sometimes called "plowing" or "pushing," occurs when a car does not steer easily into the corners. To compensate, the steering wheel has to be turned more when cornering.

Most road cars understeer, and many race car drivers prefer this. Others like to set up a four-wheel drift through the corners, and adjust their cars to oversteer.

Chart 1 (page 20) describes the effects certain modifications have on steering.

The greatest potential for improving suspensions and handling lies in the area of tires. Recent developments in tire engineering have brought us the 70-, 60-, 50-series tires. These numbers represent the relationship between the width of a tire and the height from its rim to the outside diameter (Fig. 1). For example, a 50-series tire 8 inches wide has approximately 4 inches of tire between the road and the wheel rim. Therefore, you can put wider tires on your car

without modification to the body or suspension. However, while the larger tires increase the load the car can develop during cornering, the reduced riding height makes for a harsher ride.

For the best and safest performance, these tires should be mounted on wide wheel rims. Chart 2 indicates the general relationship between tire sizes and recommended wheel width. The wider rim provides more sidewall support, improving tire stability (Fig. 2). But, before you get the checkbook out, make sure your car's wheel wells will accommodate the large rims and tires. Also, avoid any increase in wheel offset. The slightest increase usually results in excessive bearing wear. A friend of mine had such an experience when a wheel bearing froze as he was crossing the desert. His car ended up traveling down Route 66 on its roof.

In race cars, oversteer or understeer is often altered by running different-sized tires, front and back. This isn't very practical on the street, unless you're willing to carry two different-sized spares. A better way is to adjust tire pressures, within certain limits. When more cornering force is desired, increase tire pressures. However, this also reduces predictability. In either case, never decrease air pressures below those recommended for your car, or exceed recommended pressures by more than 10 psi.

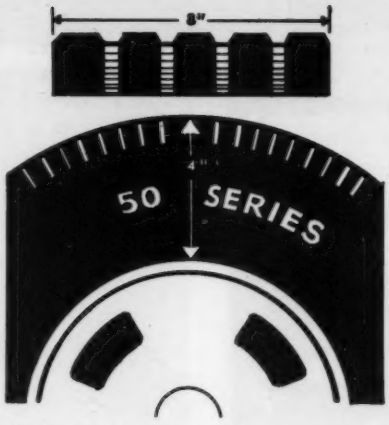


Fig. 1.

There is often talk about changing spring rates (stiffness) when suspension adjustments are discussed. Springs should be only strong enough to prevent the suspension from bottoming. Stiff springs reduce cornering ability and predictability. Stiff shocks have the same effect as stiff springs.

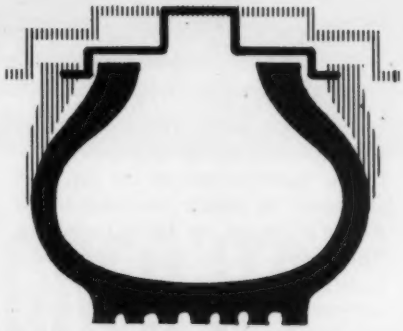
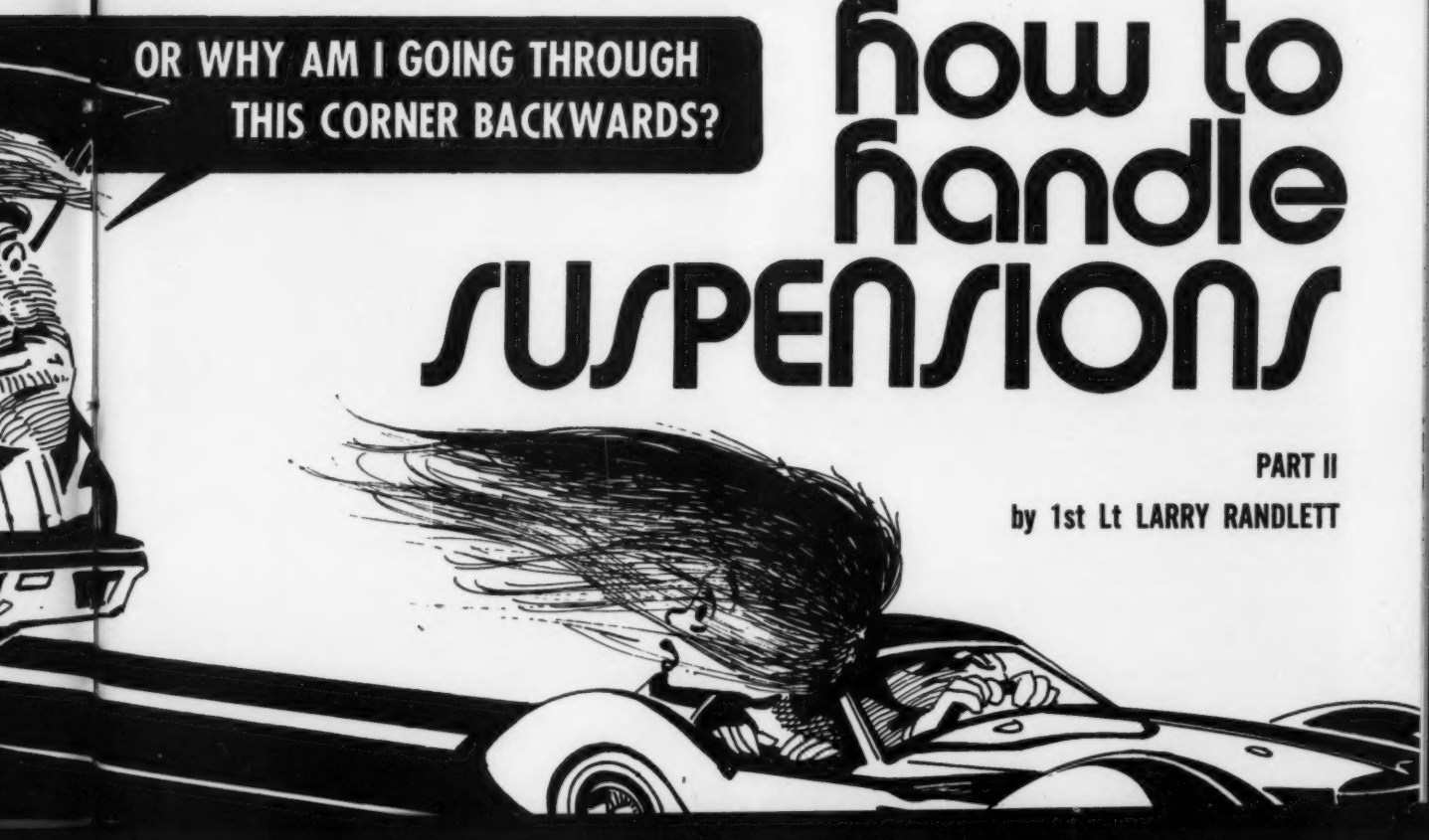


Fig. 2.

Racing cars and road cars often come equipped with sway bars (sometimes referred to as anti-sway bars or anti-roll bars). These bars connect the A-arms of opposite wheels. They have the same effect as stiff springs, but provide greater predictability. They can also create understeer or oversteer, depending upon whether they are attached to the front or rear suspensions. If too large a sway bar is used, the result can be

continued



how to handle SUSPENSIONS

PART II

by 1st Lt LARRY RANDLETT

the lifting of a wheel from the roadway during hard cornering. Front sway bars are sometimes installed on cars with a forward weight bias and an excess of power, to provide a counter for throttle-induced oversteer.

TRACTION BARS

Drag racers use traction bars to prevent axle wind-up. Unless provided by the manufacturer of the car, they can cause an unsafe resistance to the rolling of the springs during cornering. This turns the differential and axle housing into one giant sway bar. The engineers, however, did not design it for such use. As a result, rear-end failure is a common occurrence among vehicles so equipped. Additionally, these bars can induce oversteer in the middle of a turn, and suddenly you are going through the corner backwards.

These two articles should make it clear that suspensions are not as simple as often imagined. They require compromises whenever changes are made. Any changes contemplated should be carefully considered as to effect on oversteer, understeer, movement of roll center, and predictability. Suspensions modified by anyone

continued

not thoroughly familiar with their design and operation are unsafe. I have known professionals who have had serious accidents because the suspensions on their cars were maladjusted. ●

CHART 1

TO INCREASE UNDERSTEER

Adjust front-end by:	Adjust rear-end by:
Increasing weight bias	Increasing tire pressure
Lowering tire pressure	Increasing tire width
Reducing tire width	Increasing negative wheel camber
Increasing positive wheel camber	Using softer springs
Increasing the diameter of the sway bar	Decreasing the diameter of sway bar
Using stiffer springs	Raising wheel spoiler
Decreasing track*	Increasing track*

TO INCREASE OVERSTEER

Adjust front-end by:	Adjust rear-end by:
Increasing tire width	Increasing weight bias
Increasing tire pressure	Decreasing tire pressure
Increasing negative wheel camber	Increasing positive wheel camber
Using softer springs	Decreasing tire width
Decreasing the diameter of sway bar	Stiffening springs
Increasing track*	Increasing the diameter of the sway bar
	Lowering rear spoiler
	Decreasing track*

*wheel offset

CHART 2

TIRES AND RIMS

70-Series

Tire Size	Rim Width	Tire Size	Rim Width
A70-13	5.0-5.5	L70-14	6.5-7.5
D70-14	5.5-6.5	C70-15	5.5-6.5
E70-14	5.5-6.5	E70-15	6.0-7.5
F70-14	5.5-6.5	F70-15	6.0-7.5
G70-14	6.0-7.0	H70-15	6.0-7.5
H70-14	6.0-7.0	J70-15	6.5-8.0
J70-14	6.5-7.5	L70-15	6.5-8.5

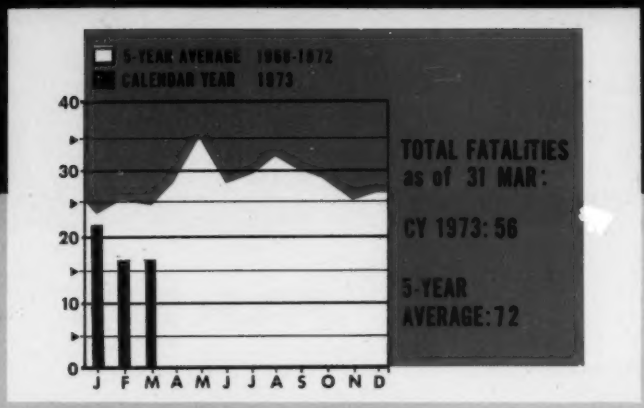
60-Series

Tire Size	Rim Width	Tire Size	Rim Width
A60-13	5.5-6.0	J60-14	7.5-9.0
B60-13	6.0-6.5	L60-14	8.0-10.0
C60-13	6.0-6.5	E60-15	6.0-7.0
D60-13	6.0-7.0	F60-15	6.5-7.5
E60-14	6.5-7.5	G60-15	7.0-8.0
F60-14	7.0-8.0	H60-15	7.0-8.0
G60-14	7.0-8.0	J60-15	8.0-9.0
H60-14	7.0-8.0	L60-15	8.0-10.0

50-Series

Tire Size	Rim Width	Tire Size	Rim Width
A50-13	5.5-6.0	M50-14	9.0-10.5
B50-13	6.5-7.5	F50-15	7.0-8.5
G50-13	8.0-10.0	G50-15	8.5-10.0
H50-14	8.0-10.0	H50-15	8.5-10.0
L50-14	9.0-10.5	L50-15	8.5-10.0

Note: These rim widths are recommendations only; manufacturers may suggest other sizes.



A monthly recap of selected accidents—presented solely in the hope some will benefit from the unfortunate experiences of others

HOW GOES IT?

DEFECTIVE VEHICLE
Rank: Sgt Type vehicle: unk POV

The Sgt lost control at an estimated 65 mph in daylight. The vehicle swerved into a bridge railing, scraped along for 32 feet, turned onto its right side, and went down an embankment. His seat belt was not fastened, and he was ejected and killed.

Investigation showed the left ball joint worn and the front shock absorbers in need of replacement.

Cause: Unknown

Probable contributing factor: Speed too fast for conditions, with loose ball joint and weak shocks contributing to loss of control.

CHILD-RESTRAINT SAVE
Rank: Sgt Type vehicle: 1971 Renault 4-door

The Sgt was killed instantly in a daytime accident, and his wife was seriously injured. A drunk driver crossed over the centerline, and his Buick sedan struck their small car head-on.

*The couple's 10-month-old daughter, who was riding in a child's seat secured by a seat belt in the rear, was not injured.** Seat belts were not in use in the front seat. Investigators found four bald tires on the civilian car.

Cause: Struck by car with bald tires, driven by a drunk driver.

** See "Child Restraints," page 8.*

WRONG-WAY DRUNK
Rank: SSgt Type vehicle: unk POV

The SSgt died 10 days after his vehicle struck a civilian-operated car head-on at night. He had *entered* the freeway *off-ramp* and traveled approximately 3,600 feet before the impact.* The sergeant was not buckled in, and the BA test indicated .23% alcohol in his blood.

Cause: Entering freeway off-ramp.

Probable contributing factor: Driving under the influence of alcohol.

MISMATCHED TIRES
Rank: Sgt Type vehicle: M-151 Jeep

The Sgt was ejected and killed, and his Sgt passenger injured, when the Jeep spun, raised up in a nosestand, and fell back on its wheels as he attempted to avoid a dog in the road at dusk.

The unit vehicle control officer had permitted the use of a mud-cleat and a conventional tire on the front wheels, which provided dissimilar traction and cornering capability. Neither occupant's seat belt was fastened.

Probable cause: Loss of control during excessive turning maneuver.

Probable contributing factors: Animal in the road; minimal control without seat belt; mismatched tires.

**See "What Should You Do?" Feb '73 DRIVER*

UNSAFE VEHICLE
Rank: Capt Type vehicle: 1967 Rambler station wagon

Three captains left a party at 0215, and the driver failed to negotiate a gradual curve on the trip back to their base. The Rambler crossed the centerline and sideswiped a 29-passenger USAF bus. The left front door of the station wagon flew open and the captain was partially ejected, and then fatally crushed when the door slammed shut.

Comments by the two surviving captains indicated the car had a steering problem. Further investigation revealed the car had been driven 19,000 miles since it was last lubed, was equipped with *four* different-sized tires, the left front tire was badly worn, and the left rear brake cylinder leaked. Seat belts were not used.

Probable cause: Fatality a result of failure to wear seat belt; accident a result of failure to maintain control.

Probable contributing factors: Reactions slowed by alcohol; stiff suspension; excessive free play in steering gear; defective brake system; and mismatched tires.

SHORT SHORT STORY
Rank: Amn Type vehicle: 1962 Chevrolet 4-door

". . . PMV, fatal . . . 0515 CST . . . Amn . . . apparently attempted to beat the train to the crossing. . . ."

THE BACK-YARD MECHANIC PART IV

To most people, an automatic transmission is a mysterious device which takes the hassle (or the fun) out of driving. Few motorists dare even contemplate the inside works of their "magic" gear box. This is unfortunate, and one reason automatic transmission shops are so busy.

There's no doubt an automatic transmission is a complex and sophisticated bit of machinery—specialists spend years learning the specifics and idiosyncrasies of the many types and varieties used today. But neither the principles behind the automatic nor the routine maintenance required to keep it working correctly are that mysterious or intricate.

You can perform many common transmission maintenance tasks easily at home, and probably avoid an expensive transmission job. All you really need is a basic understanding of your automatic. If you have serious transmission problems, however, having it repaired at a reputable specialty shop or by a qualified mechanic is the *only* way to to go.

FLUID LINK

The transmission in any vehicle has a rather difficult job—providing a link between a constantly turning engine and the drive wheels which turn only part of the time. In the "old days" (as well as today on about 10 percent of all cars), this problem was resolved by use of a manually operated clutch, which physically disconnected the engine from the gears.The automatic transmission eliminates the clutch "nuisance" (or fun) by replacing the mechanical link with a fluid coupling that allows the engine to idle while the gear lever is in "Drive."

HYDRAULIC COMPUTER

But, being more than just a link, the automatic transmission is a computer which matches your demand for acceleration with engine speed, wheel speed, and load conditions. It then chooses the proper gear ratio and initiates a gear change if necessary, and does it quite accurately if it is in good operating condition.

Various types and styles of automatic shifters have been tried since the first semi-automatic was introduced in the 1930s. Today, however, most automatics are basically the same, and consist of three hydro-mechanical devices: a torque converter to provide the fluid link, a set of valves operated by oil pressure to control transmission bands and initiate shifts, and two planetary gear assemblies to transmit the power (Fig. 1).

POWER LINK

The torque converter provides the fluid coupling. It fits onto the front of the transmission housing, and bolts into the engine. Inside its housing are three sets of blades known as the pump, stator, and turbine, immersed in light oil (transmission fluid) (Fig. 1). Energy passes from the engine through the fluid and the blades, and is transmitted as mechanical torque to the drive wheels by the output shaft. All three blade sets rotate together at cruising speed, providing maximum output with little slippage. At idle, the torque converter allows maximum slippage and very little torque output.

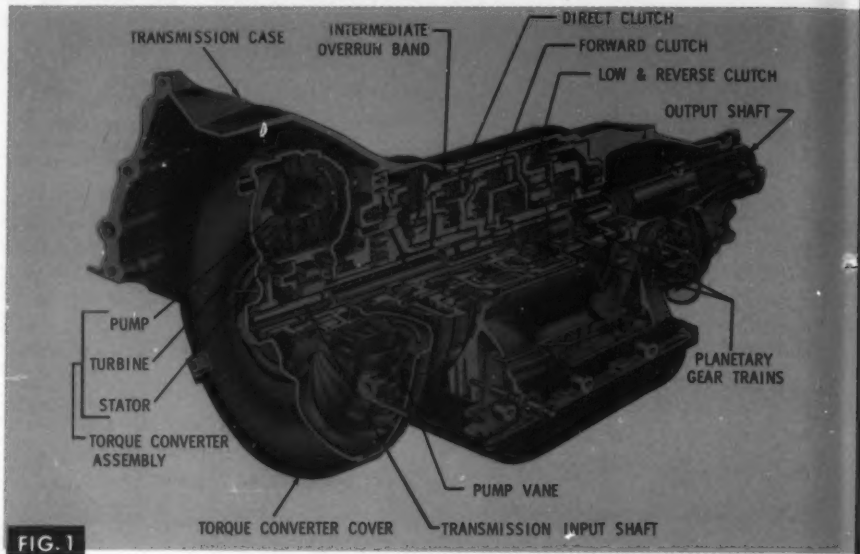


FIG. 1

SERVOS

A small pump inside the gear box initiates the big job of changing gear ratios. This pump supplies fluid under pressure to various piston-in-cylinder servos (Fig. 2). These servo units perform the hydro-mechanical functions of operating the clutches and brakes (inside the transmission) which effect gear changes.

BANDS

Actual gear changes are possible through two sets of planetary gears (Figs. 1 & 2). These gears are so arranged that those not held by a brake (transmission band) will move. A transmission band is simply a circular strip of spring steel that fits around a drum or shaft which controls a planetary gear or one of its members. When the servo-unit piston closes the band properly around a drum or shaft to keep it from turning, a gear change occurs. (Fig. 3).

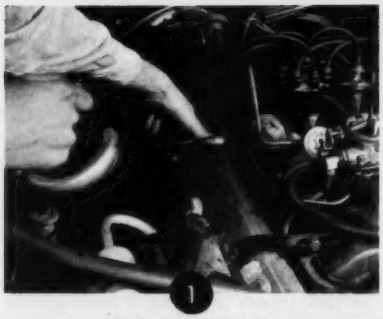
The transmission bands, however, sometimes loosen or get out of adjustment and can't clamp around the component tightly enough; then you may get "slipping" or erratic shifts and need a band adjustment. But, on most late-model cars, band adjustment is seldom necessary after the initial warranty work.

FLUID

Since the entire transmission is bathed in fluid and operates on hydraulic pressure, the best way to prevent transmission problems is to check the transmission dipstick frequently. Your manual shows the proper procedure for this—usually done with the engine warmed to

Your automatic transmission is a complex bit of machinery—but you can keep it working right, and easily cure most of its minor ailments before they become serious.

NOTE: Because of the many different types and varieties of automatic transmissions in use, this article is designed to be only a general guide. It should help the back-yard mechanic understand his transmission, and to avoid expensive and unnecessary repairs. The procedures outlined are generally applicable to all transmissions, but a manual should be consulted before doing any transmission work.



Checking the fluid regularly is the best way to prevent automatic transmission problems. The transmission dipstick is usually found at the rear of the engine compartment, near the fire wall.

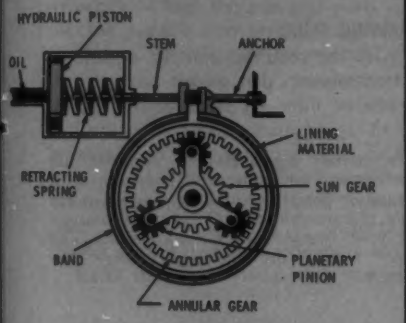


FIG. 2

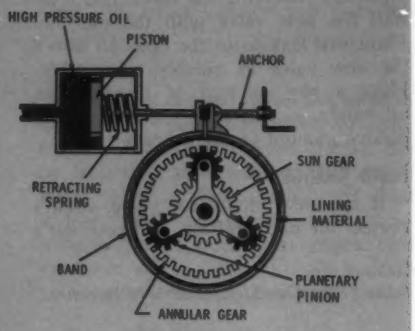


FIG. 3

operating temperature and idling in "PARK." But first work the selector lever through the gears a couple of times (with your foot on the brake) to allow all the valves and passages to fill before you check the fluid level.

COLOR IMPORTANT

The transmission dipstick is nearly always found near the fire wall on the side opposite the steering wheel. Read the dipstick in the same manner you would read the crankcase dipstick. Check for fluid *color* as well as level. The fluid should be sparkling red, with no contamination. Fluid which is orange or black, swells like varnish, or is contaminated, indicates a possible parts failure or other transmission damage.

ADD FLUID

Bring the fluid level up to specifications if it is low, using only fluid recommended by the manufacturer; there is no longer a universal-type transmission fluid.

Most transmissions are filled through the tube that holds the dipstick. Do not overfill the transmission; while low fluid will cause harsh or erratic shifts and damage the internal parts, too much fluid will aerate and cause similiar troubles. If the fluid level is above the "Full" mark on the dipstick, check it again after thoroughly heating the engine and running through the gear ranges. If it still indicates overfull, drain the excess.

Fluid is usually checked with the engine at operating temperature, and idling in "Park." Bring the fluid level up to specifications if it is low, using only fluid recommended by the car manufacturer.

Even if you keep the fluid level up to specs and otherwise treat your automatic properly, you may still encounter some transmission difficulties. Your transmission might also require a periodic fluid change or "tuneup." Most of these jobs can be done at home or in the hobby shop, with few if any special tools (depending upon the type and condition of the transmission).

MANUAL ESSENTIAL

Before getting into any transmission work, however, we must emphasize that a shop manual covering the transmission in your car is *absolutely* essential. While most new transmissions are essentially the same, there are still more than 20 different types and variations in common use; so DRIVER couldn't possibly cover even part of them in any detail.

The procedures to be discussed are generally applicable to most transmissions, but you should study your manual carefully for the specifics on yours. The manual should outline most of these jobs, step-by-step.

COMMON PROBLEM

Harsh, erratic, or "slipping" shifts are high on the list of automatic transmission ailments, and should be taken care of immediately to prevent serious damage. But, many unsuspecting automatic owners rush off to a transmission shop and rack up a big bill unnecessarily.

Bad shifts are more often the result of minor part failure or improper fluid level than anything more serious. Some less scrupulous shops have been known to replace only a minor part, and soak the customer for a lot of work not needed or completed. So, if your car develops shifting problems, it's well worth your time and money to look into it yourself.

continued

continued

THE BACK-YARD MECHANIC

TRACE DOWN A BAD SHIFT

Check the fluid first. Be especially cautious of small carbon specks which result from overheating of the fluid—these can easily block the sensitive valves and passages in your transmission. If the level is AOK, and the fluid isn't discolored or contaminated, trace all fluid and vacuum lines from the transmission to their sources, looking for cracks or leaks.

KICKERS?

If those items check out and you still have bad shifts, don't panic. Some transmissions have electric kickdown switches which can cause problems. These switches are often found on or near the carburetor—your service manual shows the location of this switch if your transmission uses one. Disconnect the switch and road-test the car. If shifting smooths out, replace the switch.

Many cars use a manual kicking valve similar to the kick-down switch. This valve is controlled by pressure linkage on the carburetor, and can be disconnected for a road test. If shifting improves, replace the valve.

MODULATOR VALVE

This items causes more transmission problems than any other part. The inexpensive little valve is used on nearly all transmissions, Chrysler products being one exception.

The modulator valve is screwed into the transmission housing, and is connected to the carburetor by a vacuum line. It is easily replaced by simply unscrewing the old valve and installing a new one. However, you'll probably need to raise the car to get to the valve easily.

Place the car's front-end carefully up on jack stands (or drive it onto ramps), set the parking brake, and chock the wheels. Be sure the pins on the safety stands are fully extended through the holes and secured—they can slip out if they're not*

Place a drip pan under the modulator valve, pull the vacuum line, and unscrew the valve. Most valves have an interior spring-and-pin assembly—remove the pin when removing the valve, and reinstall the new valve with the old pin. Fluid will leak from the hole, so install the new valve as quickly as possible. Have a pint or two of transmission oil handy, just in case you lose an excessive amount in the process.

FLUID CHANGE

If the new modulator valve doesn't correct the poor shifting, and your car's transmission is so equipped, drain the transmission reservoir and clean or replace the filter or screen. This will often alleviate shifting problems, especially those occurring in automatics which require periodic fluid changes and haven't had them.*

TUNEUP

Some automatics may need a complete transmission tuneup to correct shifting problems. This usually involves band adjustments in addition to draining the fluid, cleaning or replacing the filter, adjusting the linkage, and replacing the fluid. Band adjusting is fairly easy on some transmissions, while others require special tools and knowledge. Study your manual carefully to determine if a band adjustment is recommended, and then decide whether you're capable of doing it. Perhaps, with a little study and a torque wrench, you can do the entire job.

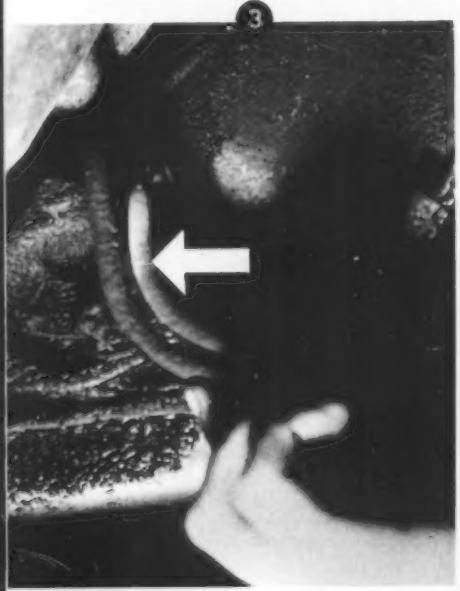
DRAINING FLUID

With the required amount of fluid, a a transmission pan gasket, and a new screen or filter (if required) on hand,

** See "Pins Can Slip," Feb '73 "Backfire."*

**On some transmissions periodic oil changes are recommended only during a tuneup or major maintenance, or when the fluid is contaminated. Check your manual for your transmission's requirements, and never exceed the specified change frequency.*

Inspecting all transmission vacuum and fluid lines for leaks or cracks is the first step in tracking down the cause of a poorly shifting automatic.



The transmission linkage and electric kick-down switch (kicking-valve) are easily adjusted or replaced. They frequently cause improper automatic shifts.

The modulator valve (arrow) is an inexpensive item which screws into the back of the transmission housing. It causes more transmission problems than any other part. Replacing this part may correct any minor transmission problems you have, including erratic shifts.

you're ready to drain the old fluid. Raise the car on stands or ramps and place a container under the transmission pan—some transmissions hold as much as 8 quarts of oil, so be sure the container is large enough to hold it all.

Some transmissions have drain plugs—most don't. If not, you'll have to remove the pan to drain the fluid. Loosen two opposing pan bolts, remove the others, and pop the pan loose with a screwdriver or putty knife. Allow time for the oil in the transmission to drain, then hold the pan steady while you remove the two loosened nuts—and be careful not to spill the fluid when you lower and empty the pan. The torque converter should also be drained. Most have one drain plug, and some have two—check your manual.

Inspect the drained fluid carefully for carbon specks or metal debris; if you find either, you may need a transmission overhaul. Clean the pan and parts such as the torque converter and filter or screen, as specified in the manual.

WATCH THOSE BOLTS

Replace removed drain plugs, fit the transmission pan with the new gasket, and replace the pan. Don't overdo it when tightening the pan bolts. Anything past "good-and-snug" may distort the gasket or the pan and produce a leak.

Refill the transmission with fluid, but stop a little short of the recommended refill capacity. Start the car and let it warm to operating temperature. Work the selector lever through the gears to fill all the valves; then, with the selector in "Park," slowly add fluid up to the proper level.

OTHER PROBLEMS

A frequent problem which terrifies an unsuspecting automatic owner is a car that won't move when he operates the lever—or one that starts in any gear.

Both of these situations are frequently caused by a loose or damaged neutral safety switch. A properly functioning switch insures your car will start only in "Park" or "Neutral." Tightening or replacing the switch will usually solve both problems. The neutral switch is usually located on the steering column, or under the selector lever housing on a floor-mounted lever. Your manual shows the exact location and gives service tips.

LEAKS AND NOISES

Leaks and unusual noises are some of the most frequent complaints of automatic transmission owners. Leaks can be serious if not repaired; they might result in your driving when the fluid is low, which can damage your transmission. Make occasional checks for splotches of transmission oil beneath your car after it has been parked overnight. Minor leaks from such areas as the modular valve, oil cooler fittings, and speedometer adapter O-ring can be easily traced and repaired.

Unfortunately, most major leaks are from the main seals, and require dropping the transmission for repair. A can of transmission sealer may help a small leak, but a major leak calls for seal replacement.

Some noise is normal in most automatics. A persistent knock or scrape, however, usually means a loose torque converter or a cracked drive plate which should be repaired immediately. Grinding, clunking, or excessive noise of any kind also indicates needed repair.

So, briefly, this is the automatic transmission story. If you take your car in for the initial (warranty) transmission adjustments, and check the fluid regularly, you shouldn't have these troubles.

But, if your transmission does get a little out of shape—keep your cool; study your manual and follow the steps outlined here, and you'll probably have it back in shape in no time. If it's too complicated for you to handle, get to a reputable shop immediately—driving with a poorly operating automatic can, and usually does, cause serious and very expensive damage. •

One of the most common transmission maintenance procedures is draining the fluid, cleaning or replacing parts, and adding new fluid. Some transmissions have drain plugs—most don't, and require dropping the pan (right).

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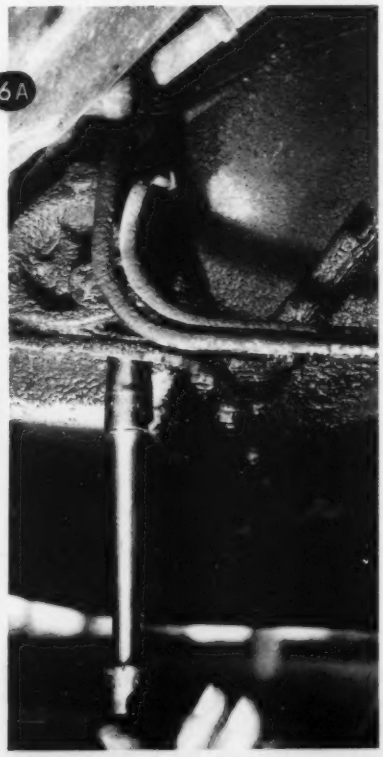
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Some automatics require periodic band adjustments and fluid drains. Band adjusting, as well as most common transmission maintenance, can usually be performed by the back-yard mechanic who studies a manual. Studying a shop manual, or general manual which gives exact specifications and procedures, is essential before doing **any** transmission work.

7

BACKFIRE

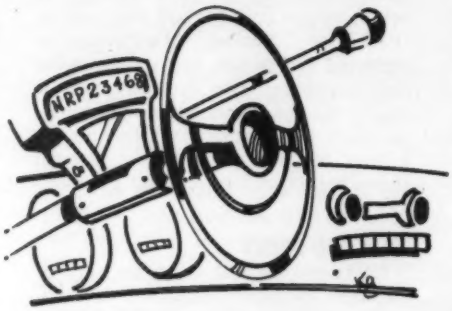
Address your letters to:
Editor
DRIVER Magazine
SEDD
Norton AFB CA 92409

FOUR-WHEEL DRIVE HAZARDS

I feel a distinct need to dispute your conclusions in "Four-Wheel Drive Hazard," Jan '73. What most likely happened was that the driver's initial brake tap stalled the engine—thus locking all four wheels and guaranteeing the accident. I have owned a '46 Jeep CJ2A, a '65 Wagoneer, and a '71 CJ5, and have always driven them on slick surfaces with four-wheel drive engaged. A skilled driver actually has better control of acceleration, braking, and steering in this mode. You must be extremely careful, however, and never hit the brakes hard enough to stall the engine; and if you do, hit the clutch immediately. Always be super smooth when accelerating, braking, and steering. Slow down well before curves and power through slightly so the front wheels pull you through. Drive as if you have just discovered the brakes don't work. Four-wheeling is a special skill, just like motorcycling, and must be learned.

Capt Daniel W. Jacobowitz
308 SMW (DOC)
Little Rock AFB AR 72076

Your instructions will help both the experienced and novice four-wheel driver. However, we feel that leaving the front wheels free when four-wheel drive is not actually needed is a reasonable safety precaution, especially with the M151 military Jeep.



SLIPPERY STARTING

"Winter Is Still Here," Dec '72 DRIVER, advises starting off in second (stick) or drive (automatic) if it is very slippery. Don't all automatic transmissions start in the lowest gear, regardless of the lever's position?

CDR Phillip R. Evans, USN
Atlantic Command Electronic
Intelligence Center
Norfolk VA 23511

We can't list them all; but in all Fords of recent years, as well as some GM and Chrysler types, the gear action is from second to high. In others, the action is to low, then second, where it is locked until the lever is moved.

SUBSCRIPTION DELAYS

Your magazine clearly states that subscriptions are accepted by the Government Printing Office. I ordered several subscriptions, the Superintendent of Documents cashed my check, but has not yet delivered any magazines.

Lt Col Jerry M. Mills
Rt 1, Box 11
Marine IL 62061

Inquiry reveals the delay was caused, in part, by time lost as a result of cancellation of the Sep '72 issue and subsequent rewriting of the printing contract. If you haven't received any copies within the next 30 days, let us know.

GMV INSPECTIONS

Congratulations, your magazine is truly outstanding, and makes a significant contribution toward improved driver knowledge and attitude. I believe you have the finest military publication in print.

Your experience with a faulty GMV from the motor pool as detailed in "Double Clutch," Jan '73 issue, is not an isolated incident. I have had several experiences with GMVs in poor condition. The requirements for safety and mechanical inspections for GMVs and POVs exist, but are not effectively enforced. I am sure you can influence Air Force commanders to enforce the existing inspection requirements.

Lt Col Clay W. Warix, Jr.
Commander, Det 32
3d Weather Wing (MAC)
McCoy AFB FL 32812

Thank you for your kind words about DRIVER, Colonel. We share your concern for enforcement of directives ordering safety and mechanical inspections of GMVs and POVs, and will bring the matter to the attention of our IG Inspectors.

NO FSN

You list FSN 8315-144-5882 for a "Pedestrian Protector Kit," but I could not get it identified at my supply department.

QMC Richard A. Florence
USS Badger DE-1071
FPO San Francisco 96601

No wonder you had trouble! That FSN has been dropped. You can order the "Pedestrian Protector Kit" from the 3-M Company, St Paul MN 55119, using GSA stock number GS-07S-02713.

THAWING FROSTBITE

Your suggested treatment for frostbite is not in concert with that established by the Arctic Medical Research Lab in Alaska. Treatment should stress these points: do not rub frozen part; this includes dry and snow rub. Immerse frozen part in agitated water at 105° F. If possibility of re-exposure exists, frozen part should be left frozen.

Lt Col James H. Stinebiser, MC
Director of Professional Services
Office of the Surgeon
Hq Alaskan Air Command
APO Seattle 98742

Thank you for the information. We used the method suggested by our Life Sciences people, who do agree that your's is a better method.

BACK ISSUES

Please send my back issues of DRIVER to complete my files on "Intelligent Motorcycling."

Sgt Tyrone E. Detrick
4789 ABGp
Hancock Field NY 13225

We managed to scrape up the issues you want, Sarge, but back issues should be on file at your base safety office. You can also order back issues through the Superintendent of Documents, Government Printing Office Washington DC 20402, at 20c per copy.

STATIC TIMING

Your "Tip of the Month," Jan '73 DRIVER, on quick static timing is valid if one more step is included. Timing mark on the front pulley must be physically positioned to the correct timing on the timing index scale before the distributor is loosened.

Lt Richard L. Keefer
COMOPTEVFOR
Norfolk VA 23511

You are quite right, Lieutenant; we goofed in assuming a novice would know from the manual and the article that the timing marks had to be aligned.

GO KART GOERS

Our local go kart club, "The Weary Traveler's Racing Team," includes members from the Air Force, Navy, and Marine Corps, as well as civilians. Ages run from 9 to 54 years, and there has not been a moving violation in over 3 years of operations. Our club feels that safe, supervised racing contributes to the driving ability of everyone involved. The International Kart Federation, 733 East Edna Pl, Covina CA 91723, can provide info on enduro and sprint schedules for kart fans.

Duke Smyth
5 Shalimar Drive
Shalimar FL 32579

Thanks, Duke, for the info and the address. We have much the same feeling about competition driving; and, like you, know that only supervised competition adds anything to the driver's skills. Racing without proper supervision leads only to trouble. Your club's accident-free record is outstanding.

MC CLUB PATCHES

The Yokota AB Motorcycle Club will exchange, on a one-for-one basis, club patches with any other club.

Sgt David M. Honn
Box 3891
APO San Francisco 96328

Thanks for the info, Sarge. Let us know about your club's activities so we can publish them in "Club News."

DOUBLE JEOPARDY

STILL THINKS IT'S "DOUBLE JEOPARDY"

"The Law and the Automobile," Jan '73 DRIVER, states the military does not take punitive action against an individual convicted of a civil driving charge. That statement is not quite true. I am currently stationed at . . ., and anyone receiving a traffic citation in town must go to court on base and face the possibility of having his driving privileges suspended on base, oftentimes for a first offense. And that, as far as I can tell, is "double jeopardy."

Name withheld

The distinction is made in the article, in AFM 111-1, and in Joint Services Regulation 125-4. "Punitive action" is defined as "inflicting, involving, or aiming at punishment." The commander, who has jurisdiction over the base court, is merely exercising his authority to provide such protective/corrective actions as suspending or revoking on-base driving privileges of marginally safe military personnel. Wouldn't you?

continued from page 6

THE U.S. ARMY'S AIR MOBILE MOTORCYCLISTS

"BANG-BANG" TECHNIQUE

The Fort Hood trooper uses a new technique in controlling the path of his bike when approaching an obstacle. It was developed by enduro riders, and is called the "Bang-Bang" technique. No one seems to know where the name originated, but the method works.

The "Bang-Bang" technique is used when approaching a sharp, unexpected curve in a road, or a ditch or large bump on a cross-country run. The trick is to approach with a series of body, clutch, and throttle-control movements that brings you up to the obstacle in an ever-correcting path, rather than charging straight at it and hoping for the best. By using light, delicate adjustments on the controls, and your body's weight to change balance, you will have a better chance to overcome the unexpected hazard.

In summing up his thoughts about the training program, Lieutenant Lewis stated:

"An injured rider is no good to himself, his mission, or the Army.

"Our training is aimed at keeping the rider in one piece, as well as teaching him how to handle his machine intelligently on any terrain, and to perform his scouting duties." ●

Unorthodox, but effective, is this way of oiling a bike chain. Pour the oil on the chain while a buddy holds up the back wheel and spins it. You will spill a lot of oil, but the job will get you through an emergency situation.

ANSWER TO "WHAT SHOULD YOU DO?"

(Back Cover)

You can't possibly stop in time, since it would take at least 61 feet, including your reaction time, and you have about 15 feet between you and an accident. Your best bet is answer B: Honk, hard brake, release, and medium brake to swerve left. Since there is no oncoming traffic, you have a safe out. Generally speaking, the best thing to do if you are going to hit something is to stop. But in this case you can't, so you have to swing left to avoid that car. Also, if you are quick enough, turn on your left turn signals to warn the driver behind you. The combination of your brake lights and left-turn signal will give him double warning that you are in trouble. ●

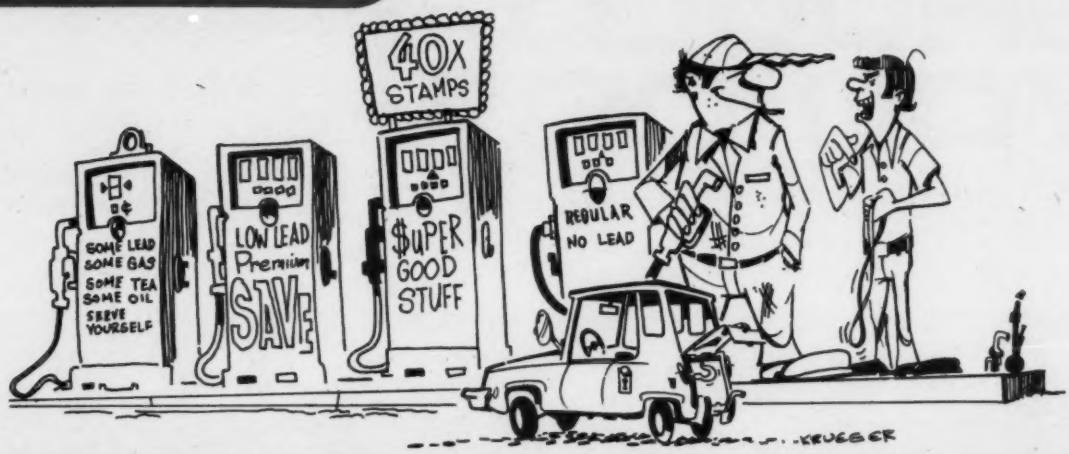
ABOUT MISS DRIVER

(See page 7)

Blonde, blue-eyed Lonnie Lewis is a biology major at Cal State in San Bernardino. Her activities include softball, bowling, snow and water skiing, horseback riding, camping, and motorcycle riding. Lonnie told us, "My girlfriend was seriously injured in an accident. She probably would have escaped injury had she been wearing her seatbelt. Needless to say, I *always* wear my seatbelt." ●

☆U.S. GOVERNMENT PRINTING OFFICE: 1973 - 789-418/7

"No gas, just give me a teaspoon of oil and help me wind up my rubber band."



A Big Improvement !

"The improvement in city conditions by the general adoption of the motor car can hardly be overestimated. Streets clean, dustless, and odorless, with light rubber tired vehicles moving swiftly and noiselessly over their smooth expanses, would eliminate a greater part of the nervousness, distraction, and strain of modern metropolitan life." **Scientific American,** 1899.

WHAT SHOULD YOU DO?

You're driving along a two-lane city street with parallel parking on both sides. Suddenly a car pulls out in front of you, just a car length ahead. There is nothing coming towards you. What should you do?

A. Honk, stamp on your brakes to stop.

B. Honk, hard brake, release, and medium brake to swerve left.

(See answer on page 28)